

HANDWORK CONSTRUCTION

EPPENDORFF



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
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Handwork Construction

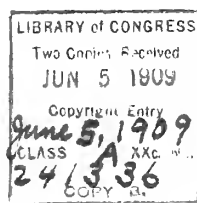
LINA EPPENDORFF
INSTRUCTOR IN PRATT INSTITUTE
BROOKLYN


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LINA EPPENDORFF



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INTRODUCTION.

“We must make a clear distinction between what we wish to teach, and what we wish to search after.”

PROF. VIRCHOW.

IT is of course not intended that each child in school should even make samples of all the methods of construction suggested by these diagrams. But it is surely time that the teacher of handwork should be expected to understand and practise more than the simple single problems that are given to children in a class. Fortunately we are beginning to see that the school curriculum is overcrowded and education too often weakened by unnecessary problems. Thru handwork, in a great many directions, a certain amount of practical intelligence can be developed in the child. This is always more successfully attained where the teacher feels herself clear and strong in a limited subject, rather than where a smattering of many crafts hurries the classes on from one topic to another.

In some schools a teacher is able to prolong courses in basketry or knotting or weaving or embroidery thru many grades, employing that one subject in applied design thruout. In other schools a new subject is taken up each year, or again, handwork is used only by the art-teacher in the design courses, where only one, two or three problems occur each year and the greatest stress is laid upon the design and planing out of the work. I see no reason to quarrel with any of these methods; a great deal can be attained thru any one. In all cases, the teacher must consider the processes of development in construction, pattern-making and design. Every problem of handwork presented in any school should be reached by preparatory stages, and should itself be recognized as a definite stepping-stone toward a future subject.

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It is not so many years since woman's handwork in the schools was confined to an elaboration of sewing and dress-making problems, from the first grade thru the high-school. There is no doubt the opportunity thus afforded for physical, mental or artistic development was entirely too limited. The young child is interested in action and altho a too close following of the stages in evolution of any industry is not essential, much may be learned from a wise selection. The child as well as the savage handles lightly at first and seeks to discover the character of the object, what it can do of itself, or tends toward doing. The next stage finds him coercing, pulling, pounding, severing with all his might, the material he has discovered; bending it to his will. When with his whole might he has battled, the student learns how far he can hope to control and gradually loosens his tension, until the same result is easily attained with one hand, or some tool. It is surprising how much force most craftsmen exert in their apparently easy handling of material. Machinery in the last stage, is too often compelled by the designer to control the material into copying effects quite foreign to its true nature.

Most machines, especially power looms, are still in the second stage of development where force masters and is wastefully expended. The present tendency toward machine methods and an easy reduction of human art and industry to such processes, renders it essential that school work should give every child an opportunity for original experiment and discovery, such as children in earlier days enjoyed in their farm homesteads. Carelessness or superficial facility, which at present satisfies too many amateurs, destroying all possibility of sound art or handicraft, should not be tolerated. Therefore, the class or test problem must lie within the range of possible perfection for every child. It should never be "well done, considering the child's age," but must be accepted because it is worth while in itself.

The materials furnished to the primary grades must be easy to handle, and render the child freer and more intelligent in his games and play-hour. The rudiments of a great variety

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of industries can be approached and played with, until they awaken in the child decision and an ability to judge, test and prove for himself.

In the grammar grades, handwork asserts its power thru repetition and perseverance, the conquering determination to make a perfect thing, if sticking to it can accomplish the end.

After 13 years of age, machinery and the control of more elaborate tools, gives the young designer freedom to more thoughtfully adapt his results in the realization of artistic visions.

While brain and hand have steadily been growing quicker and more deft, the sense of proportion and form must be as steadily developed, and the awakening joy in color and fanciful suggestion, developed thru a wise guidance in the study of design. History becomes familiar in pictures and museum objects. The copying of perfect specimens is not so essential as an understanding is necessary, of what men and women in other ages saw and how they tried to express their pleasure in so seeing, thru their work. To translate this into a question for to-day: what do we see and how can we in our own way create our own means of expression? Manual training teachers must never forget the danger they are in of converting the children in a class into facile tools ready to copy only what the teacher places before them. The more we study the history of art or the wider field into which Archæology can enter, the more convinced we become that, from the simplest form of bowl or platter to the most complex creation of human skill, beauty, harmony and exquisite proportion are everywhere possible in great variety; if the problem is not too clumsily handled or too thoughtlessly dismissed. From first to last the questions face us: proportion? proportion? proportion? And from first to last never can we ignore the fastening off at start and finish of any thread. No flimsy craftwork will be accepted by a true worker, and no artist can be satisfied with even the most fascinating color, if proportions and balance have been ignored. There is more than one guiding system which plans the course of design for our school-rooms, I trust that

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“Handwork Construction” can be applied to any. We are continually reminded that no one can teach art. Here are merely definite considerations that no handworker can ignore. Beyond the fact of creating a useful article with a money value, the power of any industrial problem over the art world, lies in the opportunity it presents for developing the sense of beauty in form, line and color; and the capacity awakened in the creator to apply his knowledge in other directions.

No handwork given to children should be pushed for them to its final ultimate. Glimpses of further attainment may be pointed out, but leave the child free to reach his own future in his own way, if the teacher has clearly furnished laws for the first principles. The craftsman and designer must be guided by his inner vision as absolutely as the poet or painter.

In basketry, knotting, weaving, lace or beadwork, there are but a few principles of construction which have endlessly been varied and combined. I have found it a great help to students to make free-hand working drawings for all their constructive problems. Working drawings and design should accompany all handwork.

“It is the essence of composition that everything should be in a determined place, perform an intended part, and act in that part, advantageously for everything that is connected with it.”

J. RUSKIN.

We use cards of oak tag 9" x 12" for mounting our sampler work, and the same sized sheets with point-edge border for making designs. One half-inch from the edge, a line of points $\frac{1}{8}$ " apart is emphasized every half-inch by a heavier point. This enables us to easily draw, in pencil, straight lines, equi-distant, in vertical, horizontal and diagonal directions. On a horizontal line, spacings for concentric circles can be easily marked, and a simple compass gives us the foundation lines for the circular and half-circle designs. The design occupies but a small portion of the card, and after it has been

INTRODUCTION

painted or inked in, the pencil lines are easily erased. Each special problem handed in is accompanied with a card with working drawings for construction, center and finish and a sample of the colors used. Where drawings are not here given, students are expected to make their own. The following exercises have been arranged to instruct the first-year students of the Normal Art and Manual Training Classes at Pratt Institute, in the principles of handwork construction. Samplers, patterns, working drawings, help them to apply each in his own way, the designs of the composition class to special problems.

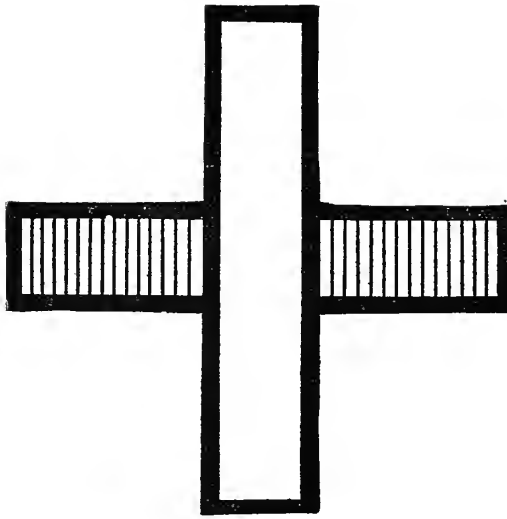
The kindergarten and primary grade work forms an independent subject, which must be considered separately, altho in the outlines for courses, I have touched upon a few problems for the early grades.

To pupils, teachers, friends who have so constantly aided me in these experiments, I extend my most sincere gratitude, realizing that without them my work were impossible.

LINA EPPENDORFF.

Brooklyn, N. Y.
1909.

PLATE I



1. The type crossing.

I.

FREE WEAVING OR BASKETRY

“Try always whenever you look at a form, to see the lines in it which have had power over its past fate, and will have power over its futurity. These are its awful lines; see that you seize on these, whatever else you miss.”

JOHN RUSKIN.

IT is expected that the teacher will make large chalk drawings on the board as the work proceeds and thus enable the child to associate a mental image with the constructive act. As soon as possible the child should be able to make simple working drawings.

Silhouettes cut from colored papers develop the sensitiveness to form which must guide the creative artist, and I expect the children to make small card models of baskets and boxes which can be criticized as to shape, before they are copied in the basket. Whenever color or borders or different stitches enter, design can be practised and should be discussed with the class. Sampler work is, of course, merely a test or experiment, and each teacher can use it as she finds best.

The child, in the stiff reed which demands the use of his whole arm, easily identifies himself with the material in action, and can more easily express such action at this stage, by a simple drawing, than later. Pattern-making, construction and design are constantly in process of development, and should prepare the child for later responsibilities at whatever stage his school days may end.

If the teacher wishes to encourage the use of wild or native material, flags, rushes, grasses gathered by the children, let her take care that these are not carelessly handled.

Raffia is the skin of a palm leaf which came originally from Madagascar. It is shipped to China and thence to Western

FREE WEAVING OR BASKETRY

cities. We procure it from seed-stores. The common dyed raffia is impossible to use in its intensity and gaudiness. But if a small bunch is allowed to come to a boil and undyed raffia thrown with this, delicate shades are possible in great variety, as different baths are used.

Undyed raffia purchased in the coil or braid (6 or 8 pounds) should always be loosened and washed. To prepare for use, allow the raffia to lie for several hours in a wet cloth; be careful not to work with it wet. Although glossy and smooth then, when the water evaporates it will be loose and wrinkled. If the worker's hands grow dry and hot, use a little water to moisten the fingers. Thread the larger end in the needle, cut off harsh or woody fiber.

The rattan is a palm vine several hundred feet long, brought from the Orient and abundant in the Philippine Islands. In our manufactories these long canes are placed in a trough, and each approaches and is drawn thru three or five small knives which strip off the outer surface in ribbons which we use for cane seats. Next, another set of knives cuts off layers of pith or reed-winding, straight on one side, curving on the other, usually $\frac{1}{4}$ " wide. At the center lies the round reed. According to the size of the vines, the numbers vary from 00, very fine, to No. 9, heavy. Large sized reeds are sometimes cut into thin slices, lengthwise, called flats. Their fibers are loose, large and very pliable.

Reed should be moistened before using, but long soaking or hot water ruin it. Cut the spokes the required length, tie them in bundles with undyed raffia or white cord; roll each weaver in a separate coil. Place these in water for 15 minutes, or allow them to remain overnight in a wet cloth. As you work keep your fingers moist.

Cane, reed-winding and splints only need to be dipped into water and then taken out. Splints are merely even shavings of ash or elm. In some manual training schools I am told the shavings from the work-shop have been used.

Uniform modeling is important in all basket-work, and is the result of even strain and pressure.

FREE WEAVING OR BASKETRY

The spokes should be stiffer than the weaver in all early work, as the latter winds in a waved line about them. Guide the weaver with the first finger and arm of the right hand. Screw and coax it about the spokes, but do not allow them to bend on the weaver. From the center all spokes should radiate straight with even spaces between them. Do not jerk the spokes, but they can be helped often by a steady straight pull or even pressure between thumb and first finger to direct their line. Moisten and press the spokes, before turning up for the sides of the basket, and also before making a border. When the pattern or shape is changed, be sure the weaver has fully completed the last row. Spokes turned up, should be held so that the bottom of the basket is toward you, the spokes pointing outwards. Use the left hand to turn and guide.

Joining Weavers. The best method of joining weavers is to trim down half size the last and the new ends, splice these together at least 3 inches, and work as one. In the finer sizes. (0, 1, 2) of reed, weavers are often merely crossed inside, behind a spoke, or slipped under the weaving. At the end, the weaver always slips under the weaving.

The center or start, and the border or finish, are most important for the strength of the basket; a flimsy basket is of no value. False bottoms may be made of wood or with heavy short spokes, and groups of fine reed inserted in the openings at the edge.

In measuring for spokes allow twice the distance from the center to the edge and a generous portion for the border. Notice variations in the diameter of your model.

Covers. There are many possible variations for flat, rounding covers; covers with hinges; covers with knobs; covers that fit over the basket in different ways and with different handles.

Handles. Handles for baskets are strongest when they cross the center as one of the long spokes and are long enough to make a double foundation. Each reed crosses to the opposite side and inserts itself at least 1 inch in the weaving, next the other handle spoke. A finer reed must now wind about this for

FREE WEAVING OR BASKETRY

some rope finish. The fine reed starts from within, out under the fourth row of weaving and is carried slanting ($\frac{3}{4}$ " apart, if small handle), to the opposite side of the basket where it again enters the weaving under the fourth row, crosses the spoke inside and comes to the front of the basket and coils next the first row of winding. Thus, until the rope twist is full.

Handles may be braided with several strands and their ends worked into the side weaving in a good interlace or knot.

One end only of the spoke in a basket may be long enough to serve as a foundation for a handle. After it has been inserted in the opposite side, cut a short piece of reed, insert in the weaving the same length as the others for the border.

Rings of different sizes are often used as handles, also the Turk's head and many other decorative knots. Cane and raffia can be wound straight and close around the foundation, but reed demands a slanting line filled in. The first and last ends serve to fasten into the weaving.

PLACING THE SPOKES.

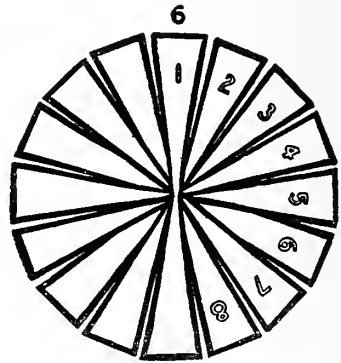
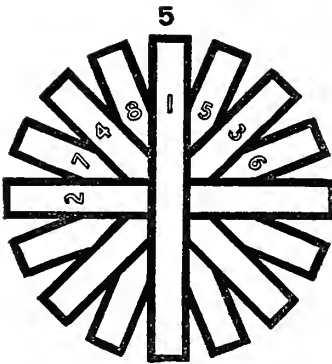
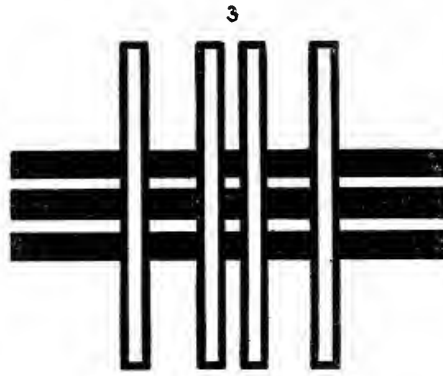
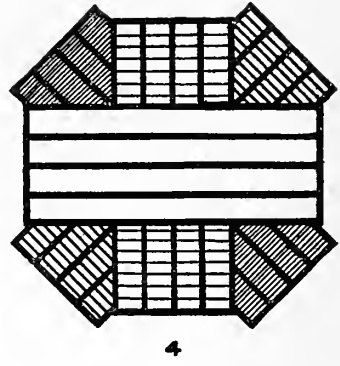
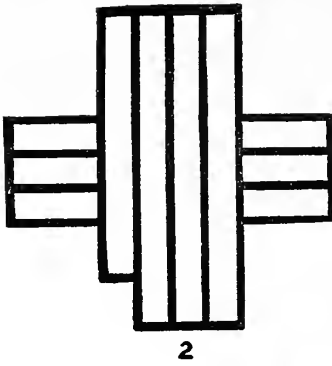
Exercises in winding have shown us that we need a foundation about which to wind. Fence-making, wattling and basketry are experiments in construction with sticks or vines or grasses, lines rigid and flexible, as distinct from masses, surfaces or points. The foundation sticks, or pieces of reed, have been called stakes or spokes; two is, of course, the smallest number we can employ, and Plate No. 1 gives us the type-crossing (at their centers) for strength and resistance. These two elements may each consist of one broad piece of splint, and beyond the crossing can, if desired, be divided into narrower strips.

Or, each element may itself be composed of separate reeds or spokes, placed side by side, Figures 2, 3, 12 and 18.

FIGURE 2. Or, if an odd number of spokes are called for, any one of the single spokes in one group may be cut off one inch beyond the center. The short spoke may be an addition to the number of evenly-crossed groups, or one of such a

PLATE II.

PLATE II



- 2. Odd spokes.
- 3. Oblong spokes.

- 4. Star-crossing, groups.
- 5. Star-crossing, single.

6. Whirl.

FREE WEAVING OR BASKETRY

group may be shortened (figure 19). Thus, for plain weaving, after the first binding one weaver will alternate over and under single spokes spirally.

At any point in the weaving, whenever the distance between the spokes becomes too great, new spokes may be inserted. Trim the ends to a point and push into the weaving beside those already secured.

FIGURE 3. The vertical and horizontal spokes may be so separated into groups as to produce an oblong or oval bottom for a basket or tray. Plan to have all the spokes the same length from the last crossing to the tip end. Figures 12 and 13 suggest the best way of holding these spokes in place. Splints, reeds.

FIGURE 4. The star-crossing is composed of four groups. Place first the vertical group, and over this the horizontal, and under these diagonally, groups 3 and 4. After the first binding, these groups are divided into smaller groups and gradually reduce to single spokes in a circle. Reeds.

FIGURE 5. The star-crossing for single splints adds new spokes diagonally underneath and between the spokes already placed, until the closed circle (within which the weaving does not appear) is sufficiently large as a center. Follow the same sequence as in the star-crossing of groups (figure 4). No. 1, vertical spoke; No. 2, horizontal, under No. 1; No. 3 from right upper to left lower corner, diagonally below; and No. 4 from left upper to right lower corner, diagonally underneath; No. 5 will come between Nos. 1 and 3; No. 6, between Nos. 3 and 2; No. 7, between Nos. 2 and 4; No. 8, between Nos. 4 and 1. As the weaving proceeds, the space between the spokes widens, and it becomes necessary to add a complete new set of spokes, either on top or below. Arrange as before, a new set; place so that a new spoke comes between every two already secured.

Or, new spokes may be inserted singly, if their ends are trimmed to a point and can be held with the center spokes under the weaving.

FREE WEAVING OR BASKETRY

FIGURE 6. The whirl-crossing is used mostly for splints, which are trimmed down in the center to a narrow strip about $\frac{1}{8}$ " wide. The whirl differs from the star-crossing in the sequence followed for placing the spokes. If No. 1 is a vertical spoke, No. 2 will be the next diagonal one on the right of the upper and left of the lower ends of No. 1; No. 3 follows consecutively, and No. 8 closes the diagram next No. 1. A larger number may be used if desired; and the better method for adding new spokes is to place above or underneath a new whirl of the same number. Splints.

Looking thus at the simple first placing of spokes, independently of the rest of the problem, we are able to suggest clearly these arrangements, by simple free-hand drawings before considering the more complicated construction. Any class can easily make these from the teacher's drawings on the blackboard. With each problem add new exercises in drawing until the visualizing of all processes is so complete that the child naturally uses a pencil to explain any method of construction.

SPOKES HOLD EACH OTHER.

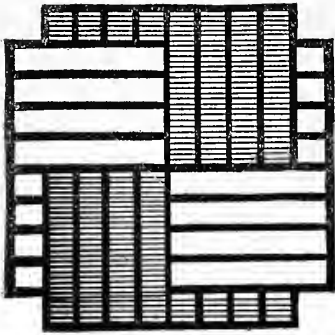
FIGURE 7. Groups of spokes interweave over and under; best for round reeds smaller than No. 3. The Japanese often use six or seven spokes in a group of No. 2 round reed; same size weaver, two strands or pairing, figures 20, 38. Gradually with plain weaving, reduce the groups, use skipped weave, figure 26. Reed.

FIGURE 8. For a square or oblong basket, with square corners, the plain over and under weave with single spokes may hold the entire base, close woven or with open spaces. Ash splints, $\frac{1}{2}$ " wide, flats, flags or reed-winding, palm-leaf or ribbons of three, four or five strands of round reeds, No. 1 or No. 0. In the first grade, strips of oak tag $\frac{1}{2}$ " wide may be used for May-baskets.

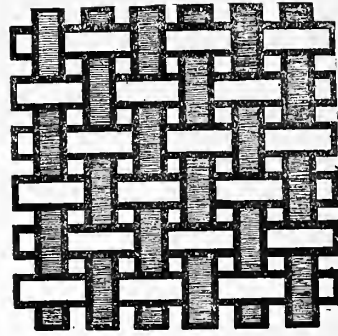
Figures 27, 28, 29, 30, 31, and 32 suggest variations for the bottom, with single spokes. The design should be carefully drawn out on squared paper, before commencing fancy weaves. Palm, cane, or flags are the best materials here.

PLATE III.

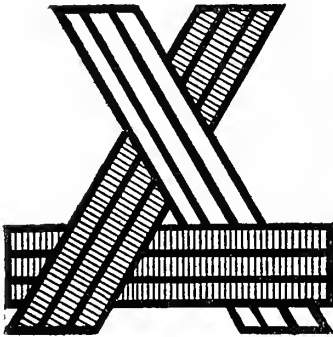
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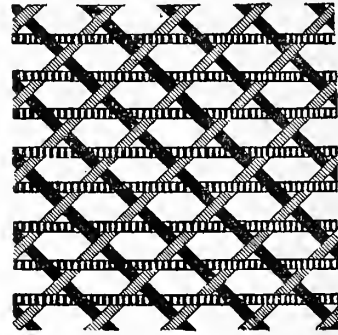
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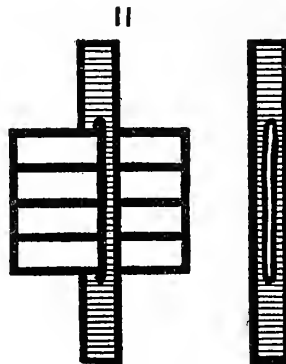
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9



10



11

7. Groups interweave.

8. Single interweave.

11. Split center.

9. Triangular groups

10. Hexagonal, single

FREE WEAVING OR BASKETRY

As in diagram 32, twining with fine reed or raffia may hold the strips securely before the sides of the basket turn up.

A diagonal placing of single flat spokes, for over and under weaving is possible. In palm-plaiting the spokes are usually held thru the center by twining raffia, as in figure 47. On the sides of the basket the spokes continue then to cross each other diagonally.

FIGURE 9. Spokes in three groups interweave around a center. Each group may be composed of any (the same) number of round reeds, and after the binding may separate into smaller groups and single elements to form a round basket. Weavers of round reed may weave, twine, or wrap about the spokes.

Spokes may be interlaced in five groups, but the center opening is usually large.

FIGURE 10. Single splints, palm, flats, flags, rushes, or reed-winding may be interlaced hexagonally. Thus are constructed round, triangular, or hexagonal shaped baskets and boxes. After the diagonally crossed strands are turned up for the sides of the basket, a new strip forms the third element and is carried all the way round, and its ends overlap on each row.

Parallel strands thruout always run under the same strips and over the others.

In a similar way five single strips of palm may interlace pentagonally, and form an all-over surface, difficult to construct, but beautifully achieved by the Pacific Islanders.

FIGURE 11. Each reed, larger than No. 2, in one group of spokes may be split or cut down the center, so that the other group may pass thru. This method is especially successful with large reeds in scrap-baskets, false and oblong bottoms, to keep the center flat. Diagrams 12 and 13 suggest the further finish. Weaving, twining, wrapping or triple twist may follow.

For false bottoms, use large reed, No. 5, the exact size of the base of the basket. When ready for the sides introduce groups of fine reeds into the openings of the weaving on each

FREE WEAVING OR BASKETRY

side of the large spokes. The Madeira border is a favorite finish, either with or without a foundation of weaving or twining.

FIGURE 12. A center, held as in figure 11, may be further strengthened and ornamented (for round bottom) by binding it with a fine weaver. Follow first the white, then the dark diagonal lines in the diagram. Place the middle of the weaver at the lower left-hand corner, carry one end over the crossed groups of spokes to the upper right corner, then underneath to the lower space between the two left-hand vertical spokes; again, bring it diagonally over the surface to the space on the right between the two upper horizontal spokes; continue to the lower right corner, finish with the other half of the weaver to the upper left corner, and reverse by crossing in the opposite direction.

Weave, twine or wrap with one, two or three weavers; finish with any round reed border.

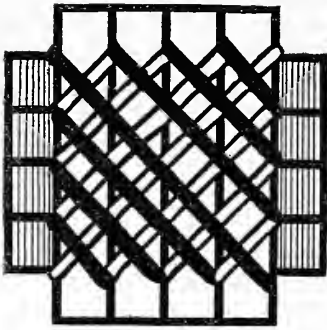
FIGURE 13. The cross-stitch binding of fine reed over single spokes of round reed crossed for a round bottom; or of raffia or fine cane, over splint, flags, flats or reed-winding. Figures 3 and 11 it is best to secure each crossing in this way with reed or raffia.

Weave, twine or wrap with one or two weavers, any border may finish the sides of the basket.

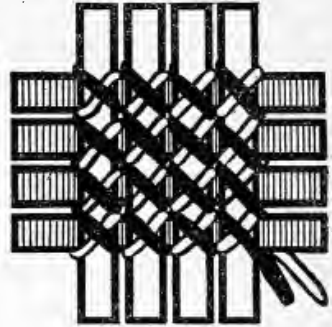
FIGURE 14. With spokes of fine reed, rush, grass or raffia to make a flexible mat or basket, cut double the length required, tie all together with raffia in the middle, and turn each end back with its other half. In the diagram each light spoke turns back with the dark strip following, to form the group or spoke for plain weaving, wrapping or twining. The tied ends of raffia can either be used as a spoke or as weavers. The hole in the center should be as small as possible, unless especially designed as a basket for ball of knitting yarn or twine, when the thread passes thru it. When the space between the spokes is sufficient, introduce a second round of double spokes, and let each end of the new group join with one preceding and one following spoke of adjacent groups. Be careful that the

PLATE IV.

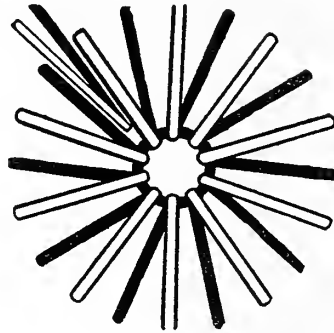
PLATE IV



12



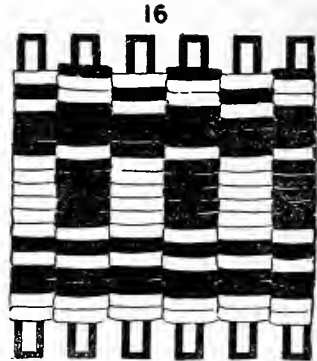
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14



15



16

- | | |
|---------------------------|---------------------|
| 12. Diagonal binding. | 14. Tied circle. |
| 13. Cross-stitch binding. | 15. Single binding. |
| 16. Tapestry binding. | |

FREE WEAVING OR BASKETRY

doubling of the new spokes shows only on the wrong side. Push the weaving, wrapping or twining close, and with raffia spokes new groups should be added about every five rows.

FIGURE 15. Groups of spokes may be separately bound together before they are crossed. Raffia, or fine reed, form the best binders. Wind around the first spoke (on the left), then above, over one and two, under both; add three on the right, and continue winding until a sufficient number of spokes are placed. Return over the last one; next over and under two, until you end with the last binding beyond the first starting point. Fine reeds placed two on two, forming a solid square, may be used in place of a single spoke, and a large number thus secured in each group. Weave, twine, or wrap the spokes in diminishing groups until you use only one. Sides and border as you wish.

FIGURE 16. Tapestry, or close raffia weaving, may also bind a single group of splint or reed spokes. The diagram suggests the use of color for horizontal and vertical stripes and broken lines, when two different strands are used. As in the last exercise, fine reeds may be used in place of one spoke, and thus in a single large group forty or more spokes may be included. Separate gradually into smaller groups or one element; weave, twine or wrap, and finish with a bound border 53, 54 and 55.

II.

SPOKES HELD BY WEAVERS—INTERWEAVING.

"I have far within me a belief that art is the love of certain balanced proportions and relations, which the mind likes to discover and to bring out in what it deals with. * * * I should say that in our plastic arts the relations of lines and spaces are in my belief, the first and earliest desires. And again, I should have to say that, in my unexpressed faith, these needs are as needs of the soul and echoes of the laws of the universe, seen or unseen, reflections of the universal mathematics, cadences of the ancient music of the spheres."

JOHN LA FARGE.

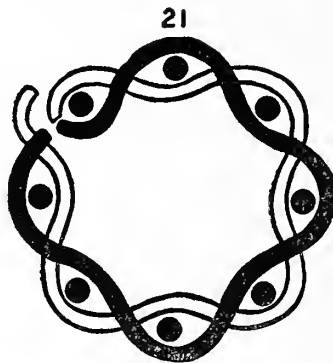
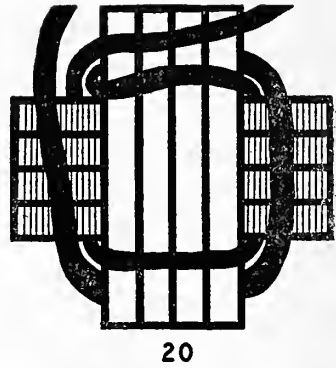
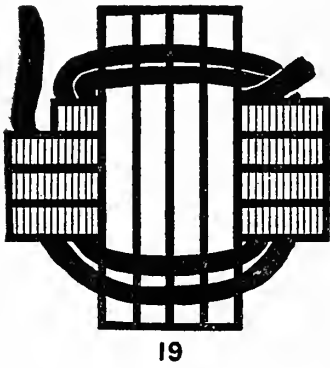
Plate IV, figures 12 to 16, have already introduced us to this subject, but now we begin seriously to consider how to fasten the weaver.

FIGURE 17. The simplest start is over two spokes. It is generally used with card strips, splints, flats or reed-winding, and makes dainty little May-baskets. Cross two spokes in the center, loop the fine end of the raffia over the top or vertical arm, bind with the doubled end of raffia. Weave over, under, over, under three times; reverse the direction from the left arm, weave over, under, over, under three times. Add two diagonally placed spokes underneath, between those already held (figure 5). Continue to reverse the direction of the weave every three rows, add new diagonal spokes as you need them. Join the strips of raffia, by overlapping the ends, and treat as a single weaver. The sides of the basket may have woven strips of the same material as the spokes, ends overlap; or these may alternate with raffia winding or twining. Push the last end of raffia under the weaving. Border 4.

FIGURE 18. The weaver-end spoke. With reed spokes a stronger weaver is called for, and reversing would be impossible. Place a horizontal group of spokes under the vertical one. At the lower left corner let the end of the weaver protrude as far as the spokes. Carry the weaver between

PLATE V.

PLATE V



- | | |
|---------------------------------|-------------------|
| 17. Reversed weaver. | 19. Weaver start. |
| 18. Weaver-spoke. | 20. Two weavers. |
| 21. Cross-section, two weavers. | |

INTERWEAVING

thumb and first finger of the right hand, under the left horizontal group, over the top arm, under the right and over the lower group. When you reach the weaver-end spoke, treat that as a group and continue the alternation. Be very careful to screw the weaver in close and let it wind over and under while the weaver-end spoke remains rigid. After four rows of weaving, divide into groups of two, pressing the spokes in place with your finger. After a few rows, weave singly, cut off the weaver-end, and in its place insert a spoke the same size as the others. If the weaver is the same size as the spokes, it is often most effective to keep the spokes thruout in groups of two. In this case do not cut the weaver-end, but insert a new spoke; and others as they are called for, where there is space between the spokes.

For joining weavers. Weavers No. 2 round reed or finer may simply cross each other behind a spoke and be trimmed later. Larger sizes must be spliced by trimming down to half size for at least 3 inches, and these overlapped ends worked as one. Slip the last end of the weaver under the weaving, finish with any reed borders.

FIGURE 19. An odd number of spokes, one weaver, simple fastening. When cutting the spokes for a basket, cut one of them 1 inch longer than half the length of the others, or so that it will project beyond the center crossing. For instance, if we cut seven spokes 20 inches long, one must be cut 11 inches. The short end of the weaver is bound close by looping or doubling around the upper vertical group, which lies on top of the horizontal spokes. Wind four times around the groups, over and under. Separate into groups of two, weave round three times; then as single spokes are possible, press the ends over your finger and space evenly. From the first, conceal or ignore the two short ends of weaver and spoke. Insert spokes as needed and finish the weaver-end under the weaving. This start may apply to any of the group placings, especially figures 2, 11 and 14.

FIGURE 20. Two weavers of reed, an even number of reed spokes. At the start, double the weaver (not evenly) about

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the upper vertical group of spokes. The spokes should be a larger size than the weaver. Weave over and under all the way round, first with one end of the weaver, follow immediately with the alternate weave of the other end; gradually divide the spokes into smaller groups or singly. Join a new weaver separately to each end. Slip last end under the weaving. Finish with any reed border. For center, figures 1, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15 and 16.

FIGURE 21. When the basket turns up its spokes for the side, if we have eight spokes and one black and one white weaver, looking down upon it and ignoring the center, we shall see something like figure 21, the spoke-ends as dots, and the weavers as they alternate over and under, black always over the black rows, white over the white. This is a cross-section diagram of a plain circular weave, even number of spokes, and two weavers, round reed.

FIGURE 22. The plain over and under circular weave, odd number of reed spokes, one weaver, after the spokes have been securely fastened in the center.

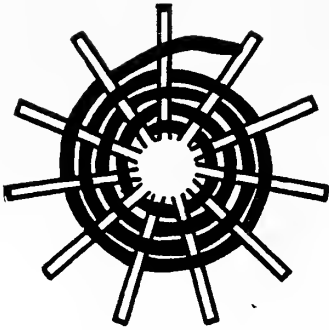
FIGURE 23. The cross-section diagram of a plain circular weave, with an odd number of spokes and one weaver, after the sides have been turned up; showing alternation of a single weaver about the spokes.

FIGURE 24. When there are an even number of reed spokes and one weaver, it is natural to carry the weaver in the same course several times; this gives us bands of ribbon weaving. Fasten at the start as in figure 19. When changing the weave carry under two spokes, as shown in figure 25. Any of the group centers may be thus treated or bands of ribbon weaving introduced as an ornament anywhere on the basket. Reed weaving or raffia over splint.

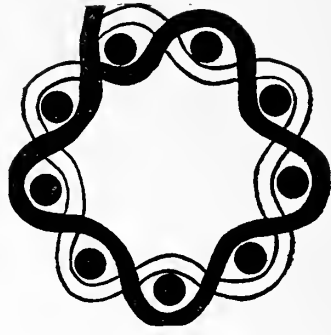
FIGURE 25. The cross-section circular weave of even number of spokes, one weaver, showing the under skip to a new row. This is sometimes called the Indian weave, it is so commonly used by them in plain weaving of sweet grass over splint. This double crossing makes a slanting emphasis on the inside surface. On the outer surface it might, by repeats, develop

PLATE VI.

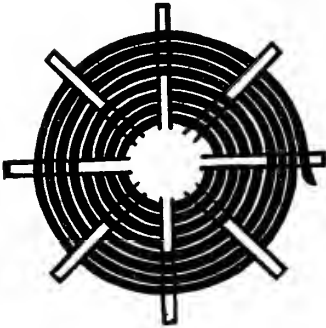
PLATE VI



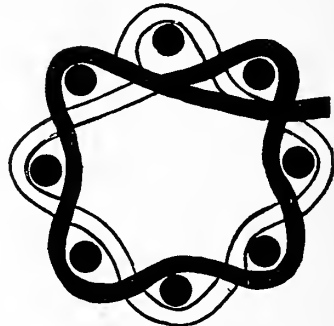
22



23



24



25



26

22. Plain circular weaving.

24. Circular ribbon weave

23. Cross-section weaving.

25. Cross-section weave.

26. Circular twill weave.

INTERWEAVING

into effects similar to figure 26. Weavers of reed, raffia or sweet grass with reed, splint or flag spokes are possible.

FIGURE 26. The diagonal or spiral circular weave, one weaver (odd or even number of spokes) works best, after fastening in the center, with a large number of spokes. The Japanese are fond of applying it to the woven center, figure 7 of number 2 reed and six or seven in a group. Skipped weaves may also be introduced on the sides of the basket, with plain weaving, if the number of spokes is right for the alternation of the weaver.

In interweaving lines of any given width or thickness, the stretched line acts similarly to a stiff spoke. When soft materials are used, the best commercial baskets are woven over a frame or box of the proportions desired. Very often, to secure a flat bottom, the start is nailed to a board and the material forced to conform to its level.

The simplest stage, next to the fine weaving or basketry, is naturally the chair seat of coarse materials, splints, cane, rushes, reed-winding, stretched over a frame.

After the first stretching of strands in one direction (reed-winding, splints, ribbons of fine reed, cane), patterns, similar to the skipped weaves of the kindergarten-mats, may be carried out. The same material may be used for crossing; or raffia over cane, or fine reed.

The chairs, stools, etc., offer either a square-cornered frame, with evenly spaced holes to hold the crossing strands, or they have a frame made with dowels over which the material is wound. For reed-winding, which unlike the splint, has two different surfaces, a second rod gives opportunity for twisting the thread in the winding.

Aside from the splint, reed or cane weaving, all the exercises on Plate VII may be applied to weaving with a needle on a frame, or a shuttle and loom. The simplest frame for needle weaving is a cardboard with notched or pointed edges for even spacing of the twine or warp threads. Straw-board, with a reed or steel knitting-needle secured at top and bottom, forms another frame. Cards may have holes punched in them

INTERWEAVING

every half-inch for the four sides of the weaving (any shape as for dolls' jackets, mittens, etc.). The holes carry a back-stitching of raffia, stretch the warp over this, and if you wish, finish the weft also under the stitching on the sides. A tape or a packer's needle, or heavy darning or worsted needle is better than a shuttle on the cards. Wooden frames may be made in the shop: pass two short dowels thru two strips of wood. Bind the warp onto the dowels with an extra twine; or place headless nails on them $\frac{1}{4}$ or $\frac{1}{8}$ of an inch apart. Wooden slate frames, or something similar, may have headless nails evenly spaced to hold the warp. Painters' stretchers can hold dowels. Whenever the warp works up and the weft remains rigid, as when stiff grass or reeds are carried thru the warp, an elastic border is called for, and twine which can give, may be stretched thru holes in wood or cardboard.

Any fabric stretched on an embroidery frame may have a pattern outlined, and within that the threads stretched and woven, instead of embroidered. The Fairbault and Todd looms have notched edges, and in the different sizes are very popular. The Woodbury and the Linen Thread Company's looms are the simplest I have seen with heddle attachment.

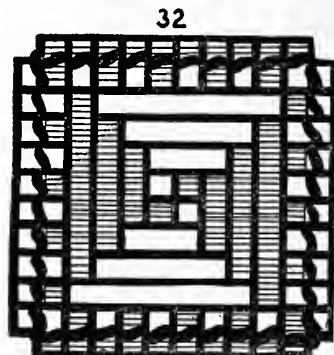
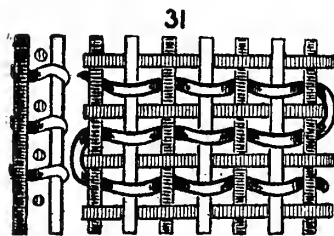
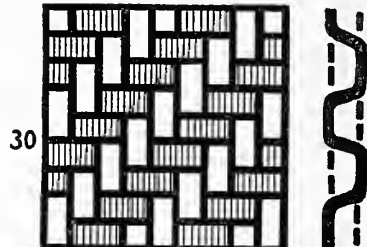
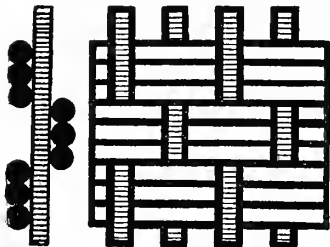
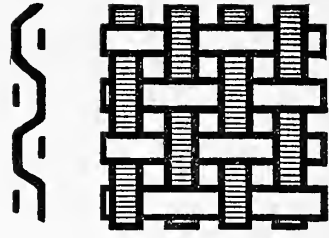
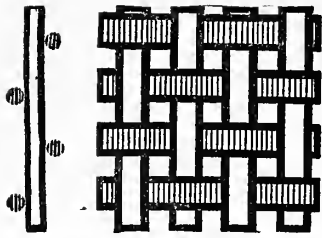
In frame or loom weaving the surface or textile constructed is called the web; the vertical strands or spokes firmly held in the frame are the warp; and the thread carried by needle or shuttle across the warp is the weft, woof or filling.

FIGURE 27. Plain over and under weaving, two cross-sections, spokes rigid, or tapestry weave. This is a chart of the simplest reed basket weaving. When threads are used in a loom or frame, the soft weft may be loose enough to completely cover the warp, and this we call tapestry, as in figure 16. With fine wool, designs may be completely worked in one or more colors and then the background filled in.

In the younger grades on the card looms, colored stripes may be woven with silkalene, rovings or worsted over cords, for articles for dolls' houses, carpets, etc., or with twine for the dolls' hammocks. Notice the cross-sections as contrasting with those in the next figure, 28.

PLATE VII.

PLATE VII



- 27. Plain weave, cross-sections.
- 28. Checker-weave, cross-sections
- 29. Ribbon-weave, cross-sections

- 30. Twill, cross-sections.
- 31. Four-ply weave, cross-sections
- 32. Center weave.

INTERWEAVING

FIGURE 28. Plain over and under checker or canvas weave, two cross-sections. Here both warp and weft wave and the end spokes on both sides alternate instead of lying in a straight line. Palm-leaf, flags, flats, splints, rushes or reed-winding produce this effect, as well as heavy threads, raffia, tape or ribbon. Both warp and weft threads are equally, though alternately, evident on both surfaces.

In the third or fourth grades, with card looms, use $\frac{1}{8}$ " wide cotton tape for weaving belts, pockets, mats, covers; round, oblong, or square. Turn the edges uniformly and carefully—do not pull too tight. Work figures in cross-stitch, from original designs, with red or blue embroidery cotton.

In the next grade, pad-covers, card-cases, and small trays, may be made with colored raffia and a bound edge. Double strands of mercerized cotton, or silk, or the heavy Bargarren linen floss, or the D. M. C. embroidery cotton (large size, in colors), give changeable effects, warp and weft different; or lines and plaids, when both vary in gingham designs.

In the second grade, strips of colored muslin (skirt-lining) torn a little over an inch wide lengthwise, can have edges evenly folded in and make very good free woven mats. Crease in the middle, start with four strips woven around a center, vary sequence of color in warp and woof, center and edges. Fold back the under strips on the surface every time you place a new strip, first at the top, then on the right, below, and on the left. Push close and fold out strips; finish ends under weaving on alternate sides. A great variety of good patterns form themselves and you can discover here the origin of the swastika. Like a game of chess, if a squared off paper is at hand, the sequence in the color of the threads determined, this is plain weaving and every alternate crossing will have the same color on top and patterns can be thus invented.

Turn the squared paper diagonally and fill alternate spaces for braid designs. Lacers, raffia, tapes, ribbons can be braided, even and uneven number of strands. The simple card frames with reeds or stitching can hold the doubled strands at the start. Let the over and under alternation begin from the very

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start; keep the edges even and the strain on all equal. If desired, a reed, at the sides, or stitching, can keep the edges straight, or a pin may be used at the turn, as in bobbin lace.

In the first two grades take three strands of different colors for first braiding exercise; in the next grade let the children invent all the variations possible with two lacers of two colors doubled. Braid arranging colors differently, also with skips. Weave, holding three strands straight, one weft; two weft, two warp; three weft follow each other over one warp. Braid in circle, looping every other strand into previous braid edge. Make solid braid, hollow braid or around a cord. These braids will all be useful in the bags woven and knotted, for handles.

When using a loom with heddles, a variety of effects may be produced with merely the over and under, two harness weaving; Woodbury small loom, Linen Thread Company's loom. Besides varying the size of the threads in different ways, and the variations with colored threads, gingham weaves, shadow weaving calls for a strong colored stencil stained on the warp threads. A fine weft veils and leaves the pattern with broken edges.

A plain woven ground may have patterns in soft wool, or cotton, or flax floss, or silk carried independently at intervals over the warp and weft, and held in place by the plain weaving. Velvets, velours, corduroys, have extra threads carried over plain weaving in weft; Brussels carpet, etc., same in warp.

The knotted Turkish or Persian rug ties either short ends or a continuous strand around two warp threads, as in figure 51. Between every row of worsted knots a plain over and under weave of twine (like the warp) is carried back and forth. A tapestry weave finishes beginning and end, and is finally woven over the side edges. Be sure to comb or batten the weaving very close and firm.

All selvages, especially with skipped weaves, should be plain over and under weaving on four edges.

FIGURE 29. Triple or ribbon weave, two cross-sections. Here every other warp strand is raised, but three strands of the weft come to the surface alternately. Notice cross-sections.

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This manner of weaving is common for borders in plain woven or sewed reed baskets. With loom weaving it also suggests opportunities for borders or spots.

FIGURE 30. The twill or diagonal weave, two over, two under; cross-sections. This is a favorite effect when weaving with cane or reed-winding or splints. It is then always better than the plain weave, as it is a little elastic and not so apt to break the strands when pushed close. Cross-sections show the uniform construction, the strands in both directions give and take the strain. In fine threads on a loom a great variety of twills and diaper patterns are possible, with a sufficient number of heddles or harness.

In weaving satin, the weft passes over warp threads (after selvedges of plain weaving); picks up one thread, passes over four (or more) and picks up one again. The following row, the thread picked up is two beyond that in warp on the first row; thus the floating threads conceal the weave, and the effect with unspun silk over fine warp, when moistened and pressed, is of an unbroken glossy surface. Thus, we can have cotton, linen or silk back satins, according to warp of same.

Damask is another variation of the twill weave. The weft passes over four or eight (single or double) threads of warp and picks up one thread. In succeeding rows the warp thread picked up is the next one diagonally across the weaving, therefore, we notice this line. Usually the color in warp and weft is the same, the patterns are produced by reversing the weave within the designed figure. Where the ground work in the weft skips four threads of warp to pick up one, the figure picks up four threads and goes over one warp. The two surfaces, therefore, offer two opposite effects in light and shade of pattern.

With plain over and under weaving, skipped thread patterns may occur at intervals, or as a border or stripe. The elaboration of pattern-making on foot or power looms, with endless combinations in harness or jacquard attachment, lies quite outside the limits of this work, and requires special instruction in designing. But school work can give a clear understanding of

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the underlying principles of textile construction, and thus imagination may be able to follow the intricacies of machine combinations.

FIGURE 31. Two-ply warp and weft, with cross-sections. Every alternate spoke in the warp lies on a lower plain than the next ones. Both spokes remain rigid thruout. Every alternate weft spoke is rigid, and treated as a spoke, furnishes the foundation for the sides of a square cornered basket. If these spokes are No. 3 round reed, the weaver may be of No. 2 or two strands of No. 1 reed, or of reed-winding or cane. Weave over and under the warp, and with an odd number of spokes, cross also over the rigid welt. A solid, strong, close foundation for trays, boxes, or square-cornered baskets, dress-suit cases, etc. Pairing or triple twist is best to give strong sides. The cross-sections show how the weavers work, and spokes should be equi-distant on all four sides.

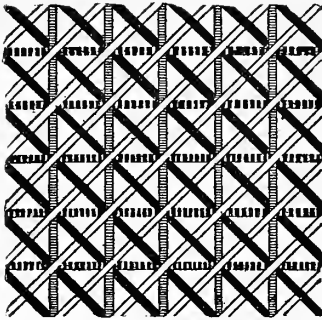
FIGURE 32. A skipped weave, worked from the center; edges twined. This is a very successful method of making designs for weaving in splints, reed-winding, cane and the covers for stools or chairs, or for constructing baskets of these materials to avoid the plain over and under weave, except at the edge. In the baskets, if the sides are turned up at right angles to the base, hold firmly by twining raffia. Work out designs on the squared paper. The sides of the basket may have woven or twined finish and a bound or rolled border.

In joining strands of reed-winding on stools or chair tops, use small-sized brass rings. Insert two ends of the reeds to be joined, turn each back upon itself, and press the ring next to the frame of stool.

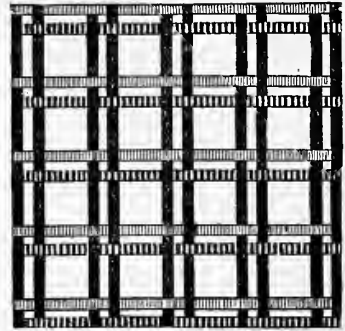
FIGURES 33, 34. Chair frames, with holes evenly spaced, or wooden bottoms for baskets or trays (little holes) may be covered with a variety of cane weavings and interlaces. A strip of broader cane is couched over holes for finish on chairs, and for baskets or trays, groups of fine reeds may be inserted, and Madeira finish can cover the wooden edge, round or square. Preserve absolute uniformity: stretch all in one direction at a

PLATE VIU

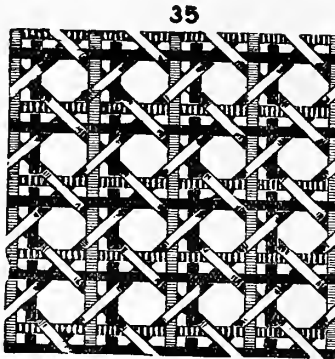
PLATE VIII



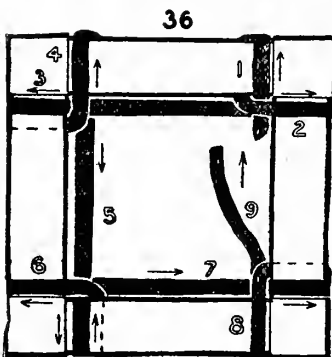
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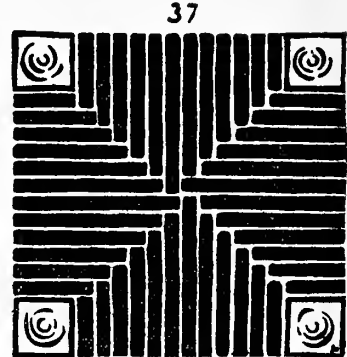
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35



36



37

33. Quadruple interlace.

34. Grouped weave.

35. Cane seat.

36. Rush-seat, start.

37. Rush-seat, finish.

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time; avoid too large holes, and make as many designs as possible. With palm or cane, entire baskets may be thus woven; bind the edge.

FIGURES 24. 35. The double octagonal inter-lace for cane seats. The holes on the frame of the chair occur so that stretched strands lie straight, parallel or at right-angles to each other. When the shape of the seat is circular or curving, some holes may be skipped in order to keep parallel lines equi-distant, but a hole skipped on one side demands a skip on the corresponding opposite side of the seat. For a practise problem, flax twine is sometimes used, then varnished.

The cane should be dipped into water, but not allowed to soak long, and as it shrinks when dry (contrary to raffia), care must be taken not to pull the strands too tight or the frame may be broken as the cane dries. Three or four small wooden pegs are used, which can be inserted as soon as the cane has been stretched through a hole. The first need not be removed until the end, but the last can be moved on as the work proceeds.

Start with the middle of a strip of cane in the lower central hole, insert the peg, and carry the cane to the corresponding upper hole, peg. Bring the cane up thru the next hole on the right, peg, and continue until end of the weaver. Proceed with the left-end strand on the other half of the seat.

The ends are often joined by a simple tie, or by binding one end over the other. This leaves the wrong side of the frame far from neat. The best finish is to use a small brass ring ($\frac{1}{8}$ inch in diameter), insert both new and old ends of the cane and double each back, carrying doubled ends (back to back) thru successive holes. The ring must be used against the frame, then added strain tightens the strands. If rings are not used, stretch the last end of cane over the next hole, insert the new weaver from above and double its end back on itself. The succeeding weavers will hold the end in place.

Professional workers, considering speed mainly, use their discretion in the sequence of placing strands. Some prefer to stretch the second row of strands horizontally across the first vertical row. The third row then repeats the first, in the same

INTERWEAVING

holes, and the fourth row follows the second, but is careful to interweave between the crossing vertical strands, and always maintains an alternation over and under of the weavers, as they occur in both directions, figure 34.

Other weavers prefer to repeat, for the second row, the first vertical strands, and in the third and fourth rows interweave alternately.

FIGURE 35. The fifth and sixth rows run diagonally over the horizontal pairs and under the vertical pairs, or vice versa. In deciding which sequence to pursue, discover which crossing will allow the diagonal strands to slip in most closely into the previous interweaves. The vertical and horizontal strands lie in groups of two between diagonal crossings above and below them. Over all parallel strips of cane, the diagonal lines cross in the same directions above or below.

When very fine cane is used, some workers insist that the best way is to carry first a vertical, then a horizontal, then a diagonal line, from left to right over the first and under the second. Next interweave a second horizontal line; then the second vertical one, and last, the opposite diagonal strand which reverses under, over.

To cover the holes in the frame, use a broad strip of cane, start at one corner hole, return to the same. Couch with fine cane, skipping holes evenly and securing corners.

Fancy interlaces are used in thread for lace effects (either with or without knotting), on the surface of fabrics, or to fill cut spaces. A still greater variety of designs are here possible.

FIGURES 36, 37. The rush-bottom or flag-seat.

For the rush-bottom seat a frame is provided, with rounding edges and a definite, substantial corner that rises a little above the connecting frame, and suggests how thick the coil of the rush should be. If rushes or cat-tail flags cannot be procured, heavy hemp or sisal twine or raffia are possible. In the southern United States ropes of corn-husks are thus used, and thruout Europe the exquisite golden finish of rye straw, wound over twine or grass, makes the most attractive seats.

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The rushes or cat-tail flags should be cut in August; the butt ends removed; all thoroughly dried and so handled as not to be broken. Before working, allow them to lie in a wet cloth, to soften. When using, squeeze the air and water out by pressing each leaf from the tip, between your thumb and first finger. Four leaves usually compose a strand; twist in the same direction, and keep uniform in size. With flags or rushes the strands stretch underneath without twisting, and new leaves are introduced at the corners where the coil turns back for a new direction. The last end is pushed under the stretched strands below.

The winding proceeds from the outer corners toward the center, and if the frame is not square, two opposite sides of the frame are filled with straight winding back and forth. Professional workers have a small wooden knife, like a paper-folder, with which the strands are straightened, pushed in line, or smoothed down.

After the wrapping is finished, broken ends of rush, excelsior or even paper, are stuffed into the middle to make a firm, solid seat.

When raffia is used, color can be introduced. Borders or centers can be planned with contrasts of color. The winding is sometimes varied by group crossings.

This is a very useful problem in eighth grade or high school, when stools are made in the work-shop.

III.

PAIRING OR TWINING. WRAPPING.

"It is the definite individual character of an object which makes beauty."

W. H. HUNT.

"There is nothing careless in the art of design, even in the little art of ornament."

JOHN RUSKIN.

Twining applies to the half-twisting of two weavers about given spokes; when the weavers are comparatively stiff and strong, as in the rattan reeds or willow, the name pairing has been used. Whenever in weaving we wish to hold one or more spokes a given distance apart, the twining or pairing will secure them.

Sailors make mats with strips of wood, as the Japanese make screens, joining them by twine in the Malay hitch (or twining). Among the ruins of the Swiss Lake-dwellers, specimens of plain weaving and twining are found. The North Pacific Indians use this construction constantly in making blankets and rugs, as well as baskets. In the drawn-work of modern Mexican lace the stitch is called fagoting. In fine threads on power looms it is known as a grenadine weave.

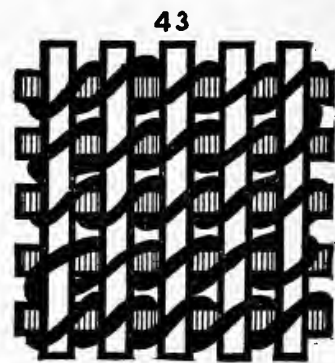
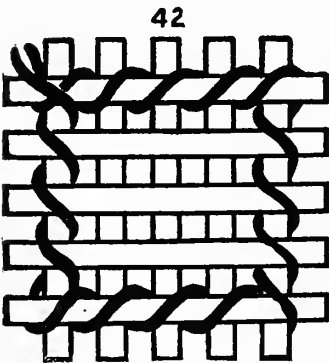
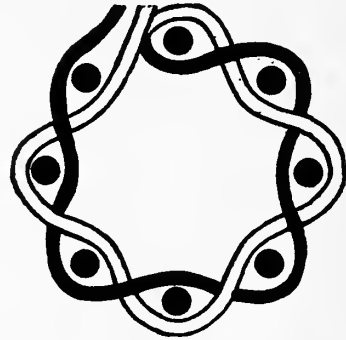
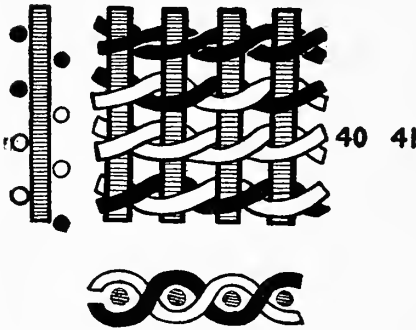
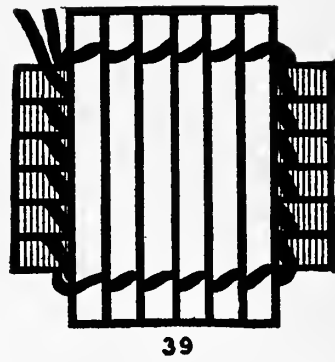
Sometimes a weft thread weaves under and over straight across, and the needle brings back the thread diagonally over and under succeeding strands of warp, so that each is held by two weft threads crossed between them.

The placing of spokes has already been discussed and some problems given especially applicable to twining. It is important that the strain on the two weavers should be uniform. When new weavers are called for join each end separately by splicing.

Horizontal, vertical, or broken lines of color are achieved by using different colored weavers in reed or raffia.

PLATE IX

PLATE IX



- | | |
|---------------------------------------|--------------------------------------|
| 38. Pairing, groups. | 41. Twining, circular cross-section. |
| 39. Twining, single. | 42. Twined spokes. |
| 40. Twining 2 colors, cross-sections. | 43. Twining, crossed spokes. |

PAIRING OR TWINING.

FIGURE 38. Pairing for the start or center. A long flexible weaver of round reed is doubled near the center around the upper arm of two groups of crossed reed spokes. Both ends are brought forward and pulled close to the center; carry the left end in front of the upper group of spokes, over the right weaver, under the right arm of the horizontal group of spokes, and draw it close to the center. Use always the left weaver, and come to the surface one space beyond the right weaver. Divide the groups into smaller numbers, and finally single spokes. Use any of the group centers, odd or even.

FIGURE 39. Each spoke in a group can at once be held separately by the two weavers of raffia, or fine reed. Use any single spoke center or woven centers, 2, 3, 5, 8, 11, 12, 13, 14, 15, 16.

For holding warp threads in an Indian loom, or for securing a slight uniform distance between spokes of splint or reed, twine with cord or raffia.

The two crossing groups in the button of palm plaiting are each held separately by twining, thru the center, with raffia or fine thread.

FIGURE 40. Twining, two colors; two cross-sections. When the two weavers in twining are of different colors, an even number of spokes gives vertical stripes, and an odd number of spokes, diagonal ones. Interesting designs for straight and broken line effects are abundant. The lower cross-section shows the origin of the Greek guilloche.

FIGURE 41. Pairing or twining, circular cross-section.

FIGURE 42. A center for twining. Spokes may cross, allowing spaces between them in both directions; and the twining may pass over both at the outer crossing only. For round or square-cornered baskets, a strand of reed may coil continuously up the sides and over the cross spokes, lying in both directions. Twine over these with raffia or fine reed.

FIGURE 43. A center for twining square or round baskets. Each row of crossed spokes may be held at each crossing by twined weavers, either close or far apart. Be sure the weavers cross as they approach and start a new row. If the twining

PAIRING OR TWINING

reverses its direction, on successive rows, a herring-bone effect is given. After the entire base has thus been constructed, the sides may have the underlying coil continue for the twining to pass over the spokes and coil. With square-cornered baskets, trays of splint, or reed-winding spokes, the strips on each row have their ends overlapped.

With this base, the sides are often of single twining only; the crossing splint is introduced to strengthen the bottom, or decorate the top as a border.

Some designs call for an indefinite number of stitches of one color, and more than two colors in the twining. With plain twining each raffia weaver may have a strip of another color underlying it and the color called for always turned uppermost.

FIGURE 44. Twining with two colors, cross-sections. When the design in two colors calls for an irregular grouping of stitches, the raffia may be used, as in diagram 44. When necessary, carry one weaver straight, instead of diagonally, across the back of the spoke, and let the front weaver fold over this. Cross-sections show the manner of working still more clearly.

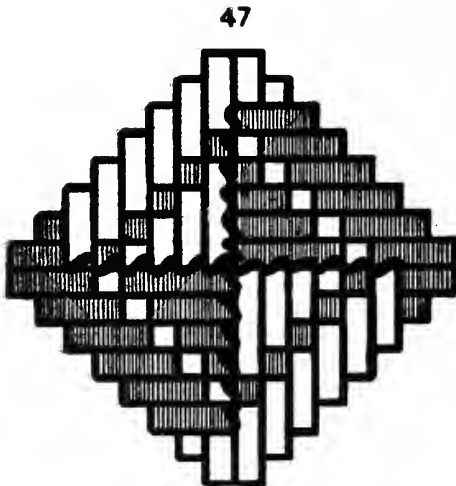
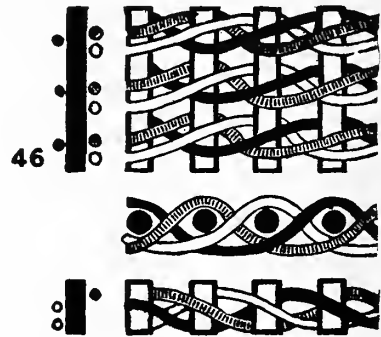
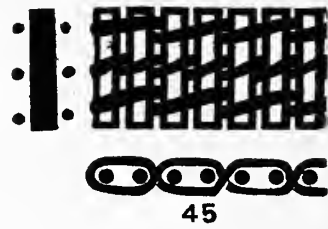
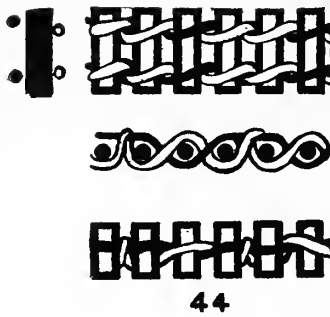
FIGURE 45. Double twining, surface and cross-sections. Weavers the same color.

FIGURE 46. The triple twist with cross-sections. Three weavers are used and, in this simplest rope arrangement, each weaver at the left of the three successive spokes is held closely to the center. As in twining, use the left weaver always, carry it in front of two spokes (over the two weavers), cross behind and come out to the right of third spoke. In other words, the work grows by carrying the weaver from the left under and out beyond one new spoke on the right and applies equally to four or more spokes provided with the same number of weavers. Colors may be used also. This is one of the most effective of all-over-weaves, as well as the strongest. It should always secure the turn from the base in scrap-baskets.

A number of variations of the triple twist are possible if one alters the crossing of the weavers, as in braiding upon the spokes with different numbers of weavers.

PLATE X

PLATE X



44. Twining 2 colors, cross-sections.
45. Double twining, cross-sections.

46. Triple twist, cross-section.
47. Palm-plaiting, the buttons.

PAIRING OR TWINING.

FIGURE 47. Palm-plaiting, the button or start, held by twining with raffia or thread. To have the palm-leaf pliable, place it in a wet cloth several hours before using; do not soak it in water, but keep your fingers moist while you work. Flags, rushes, fine splints, or strips of oak-tag also may be plaited. We have studied one, two, three or more weavers carried over a definite number of spokes, but in plaiting each strand crosses under or over every strand running in the opposite direction.

Cut the palm-strips (any number divisible by four) equal lengths, divide in two groups; twine each thru the middle with fine raffia, tie at the end. Place one group (dark) horizontally before you, with the vertical twining in the center. Find the center of both groups, place the other at right-angles over the first. Slip the right upper half of the vertical or white group under the upper, right, dark, horizontal group. The lower, right, vertical group lies over the lower dark horizontal one. Slip the lower, left, light, vertical group under the lower, left, dark horizontal; the upper, left, vertical, light group will lie over the upper, left, horizontal dark group. The center may interweave according to any design planned on diagonal squared paper. The twining runs to the four corners, and it is easiest to work one-quarter at a time, diminishing each row the number of crossed strips. Before turning up, let each of the strips in three quarters, lie on top in one direction, below at right angles in the opposite direction; and the crossings alternate in sections, as in the diagram. Let the last row all the way round plait over and under one. If the plaiting does not come out even at any row, there must have been a mistake. The sides are now ready to turn up diagonally and at right angles to each other in any given section. Begin at the upper corner. The left, upper, vertical, light strip is crossed under the right, upper, vertical, light strip (both next the twining of the horizontal strips). The right, upper, dark, horizontal strip passes under the next (second on the right) light, vertical strip. Plait once all the way round thus, reversing the position of the strips; hold the corners firm and proceed with patterns, as designed on diagonal squared paper.

PAIRING OR TWINING

Keep the rows even and evenly pulled close. Use the diagonal palm border 56, as finish.

If a strand breaks, cut it close to the weaving and insert a new strip over the same strand in the weaving. Wooden molds, square or round, are often used to press the moist basket over.

When a round basket is desired the center may be started square, and new strands added, so that each strip in both directions is worked double for two rows, then divide into single strands. The ends at first project on the surface and are trimmed off when the work is finished. Or, on the wrong side of the basket, a new strip may be folded in half, each end working with two successive spokes in opposite directions.

Designs can be worked out in different colors. Make models for the form of the baskets in tag cards.

WRAPPED STITCHES.

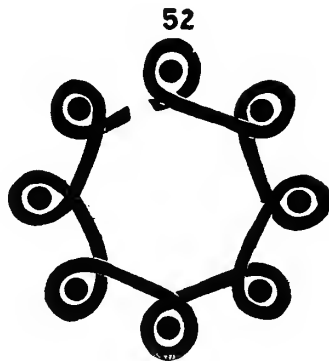
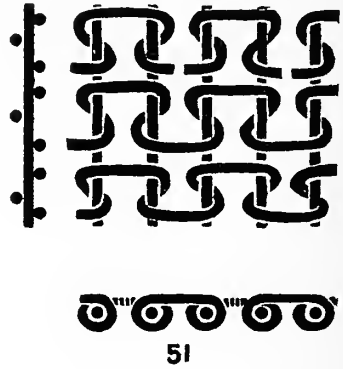
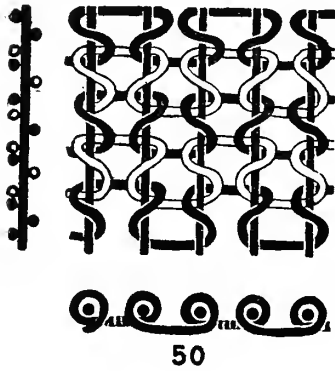
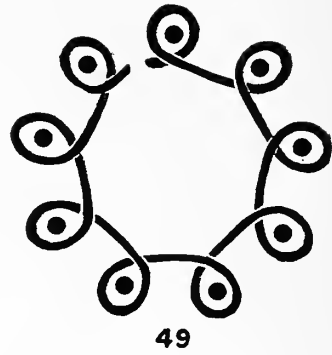
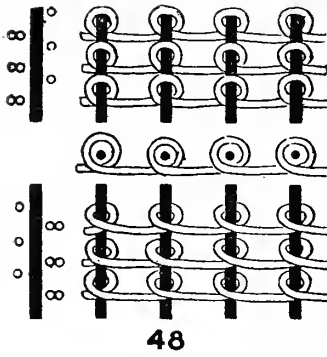
FIGURE 48. Wrapped stitches come half-way between weaving, sewed, and knotted work and share many points in common. After the spokes have been securely fastened in the center, the raffia or fine reed may be wrapped under two spokes back over one. This Mohave wrapped stitch is known in India as the Cashmere stitch. Heavy worsted carpets or fine camel's hair shawls are thus woven.

The reverse side makes a new effect of half-cross stitch. On the rugs, fine worsted is thus wrapped over flax warp, to make many patterns with slanting edges. Other designs are filled in about the first.

For small baskets with fine reed or split reed-winding spokes, this wrapped stitch is effective, worked in raffia. Small twine-ball cases, started like diagram 14, tied with raffia which serves at once to wrap four spokes together, and leaves a hole for the string in the center, can gradually be divided in smaller groups. After the sides are completed with stripes of colored raffia, divide the spokes into four groups, bind these down until they end with a loop at the top. A raffia ring can hold all

PLATE XI.

PLATE XI



48. Cashmere weave, cross-sections.
49. Cashmere weave, circular cross-sections.

50. Jersey or knitting weave, cross-sections.
51. Rug looping, cross-sections.

52. Circular cross-section, 51.

WRAPPING

together and yet leave free space for introducing the ball of twine. Make baskets for knitting balls with large rings for handles to slip over the arm of the worker.

FIGURE 49. Circular cross-section of Mohave wrapped or the Cashmere weave.

When constructing a melon-shaped or saddle-back basket, two circles of reed are carefully wound with raffia. One ring represents the upper edge of the basket; lies horizontal, and is crossed at right-angles by the other circle, which forms a handle and the mid-rib of the bottom. Where these two circles cross each other they must be firmly bound together. After the first raffia winding, carry fine cane or fine reed in this wrapped stitch (diagonal line outside) over the four crossing arms, over two and back under the last, until a four-sided shield or diamond is complete. Strips of splint, or reed winding or flats can form the spokes of the basket. These lie horizontally, are pointed at the ends and fit in close under the shield. Beyond the wrapping, let fine cane or raffia weave back and forth from edge to edge of the basket. A great variety of shapes are possible, and card models may be made with strips of oak tag.

The Mohave wrapped stitch has been used by the Mexicans to make gay little flags of worsted, over sticks crossed at right-angles, which they use in out-of-door games.

FIGURE 50. Double wrapped method of weaving used in some parts of South Africa for raffia, or fine reeds, over reeds. If the vertical lines were removed we should have a perfect diagram of knitted stitches. Whenever knitting or stockinette is to be carefully mended, as in bead bags or fine stockings, stretch vertical threads and loop over two with these stitches. We go over one, under two, over the last, under two and over the last alternately, above and below. The other side gives us the reverse effect, or purling as it is called in knitting.

FIGURE 51. The Ghiordjes or Turkish rug knot used in making pile rugs. Between every row of knots there must, in the rug, be two rows of plain weaving, over and back. Here the spacing remains uniform, as this is a stitch which can be woven in reeds effectively on the sides of baskets. If the two

WRAPPING.

ends coming up from below, between the same warp threads, were pulled tight, so that the two warps were pushed close, the lower outer loop left longer, we should have exactly the effect of the Turkish pile. These must all be trimmed off evenly afterwards.

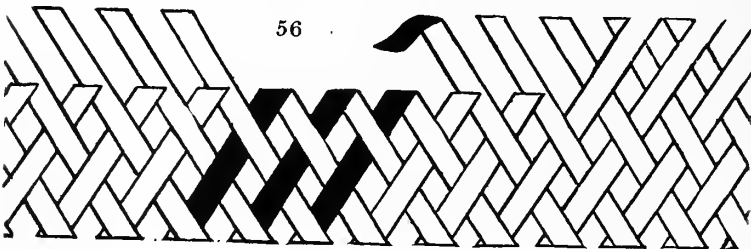
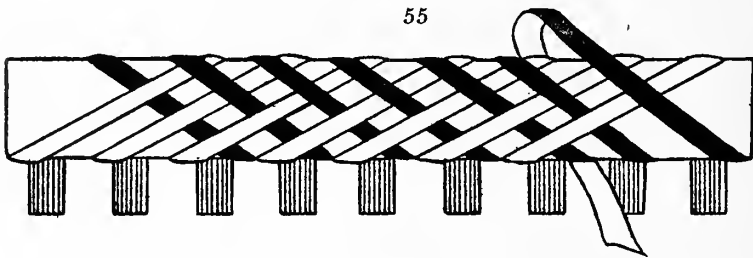
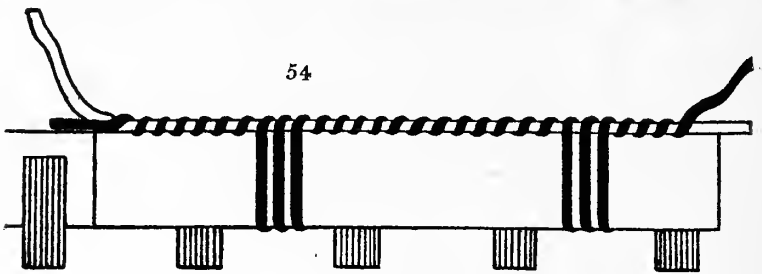
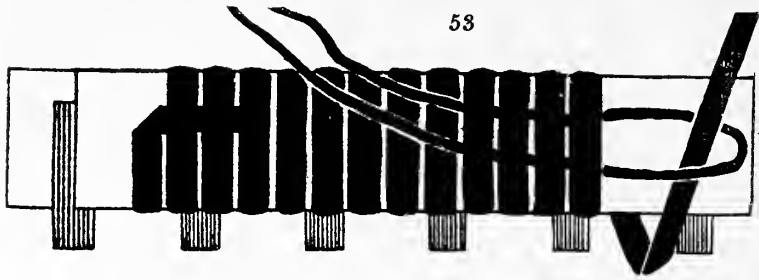
When short ends of worsted are used, it takes longer, and must be trimmed in the same way. There are three or four other simple twists, given to the short ends of worsted, by the Orientals in making their rugs. The finish on all edges is usually tapestry weaving; and the flax twine, plain weaving, constructs the real web and pushes fast the knotted ends of worsted.

FIGURE 52. The circular cross-section of the rug or wrapped stitch.

The reverse surface might also appear on the outside of the basket.

PLATE XII

PLATE XII



53. Edge binding.
54. Grouped binding.

55. Diagonal binding.
56. Palm or splint border.

IV.

BORDERS.

"The important thing is that the end of beauty be gained without sacrifice of use, and without greater expenditure of time and labor than is justified by the purpose in view."

LEWIS F. DAY.

We have studied the possibilities of placing spokes, holding them securely at the center or edge, and weaving differently with a great variety of materials; not less important is the final finish, which shall most securely form a border. It still remains for the original worker to experiment and choose wisely the finish, the surface, the start as related to the form and use of her basket.

Borders vary according to the materials; flat or round, large or small sizes, flexible or rigid; and according to the methods of weaving, the number of elements to be considered, and the size and proportion of border desired. They may be made with weavers, with spokes, or with both. All ends should be concealed.

Always be sure that the spokes are cut even length, moistened and sufficiently pliable to pass easily over the first finger, before you begin. Allow very generous lengths for borders with reed spokes (4 inches to 20 inches each). Never cut any spoke until you are sure that after the work is dry, enough has been allowed for a good firm finish. You can trim after they have been thoroughly dried. On the other hand, avoid leaving the spoke-ends too long, as they will interfere with each other and fail in neatness. When working with heavy, large-sized round reeds, as in scrap-baskets, a small bit may be shaved out of the spoke (next the basket) to allow it to bend more readily.

BORDERS

If any spokes break, cut them off close to the work; point a new piece of reed and insert it more than an inch in the weaving, cut even with the other spokes in length. Make working drawings of the variations.

WEAVER BORDERS.

FIGURE 53. The edge of a basket may always be bound with raffia, cane, fine reeds or splint fillers. This finish is usually preferred for flats, splints, reed-winding or fine reed spokes (which latter may have been twined with raffia). The spokes are either turned in or cut short, so as to be completely hidden by two pieces of splint or reed-winding, one carried in front of the spoke-ends, and the other behind them. These strips overlap on different sides of the basket. The weaver-end is concealed and held between these strips.

The fingers should press and hold this work hard and firm. If raffia is used, it may be threaded in a needle and sewed smoothly over the edge, piercing the spokes. End each thread between the flat binders.

For cane, splint fillers, raffia (where no needle is used) wind smoothly over the outside strip (where the spokes interfere) and between spokes, bind firmly both strips together. To finish the ends use the extra loop of raffia or string about 6 inches long. Double this next the outside splint with the loop-end at the point where the finish is to be. Bind over the loop-ends and the strips of splint; when the loop is reached, insert the weaver-end loosely, pull the cut ends of the loop, and the weaver will take their places under the binding and can be trimmed off.

FIGURE 54. The Chinese and Japanese often use a border of hard pieces of bamboo, securing this by a few windings, some distance apart. In order to carry the fine cane binding from one group of stitches to the next, it is wound evenly about a small twine or very fine reed, carried along the upper edge of the basket. At the given intervals, the long stitches firmly bind the strips and the string to the basket. Hold very firmly.

BORDERS

FIGURE 55. Another method of finishing a weaver border (fine cane or raffia), is often used by the Japanese as well as the North American Indians on twined baskets. The effect is of a continuous over-lapping cross-stitch. Keep the length and slant of the stitches uniform. In the diagram, the light strips represent the cane carried upward to the right, and the dark strips, the return of same toward the upper left edge; carry the weaver straight down at the back. Use the extra loop to secure the end; start new weavers between the strips. With care a variety of intricate patterns are possible, and handles for bags, teapots, baskets, are very successful.

At intervals the direction of the windings may be reversed, single or double.

A similar effect may be produced without the horizontal strips, by braiding with three or more strands of reed over the reed spokes; hold very firmly. Triple twist in many varieties also may form a border. Diagram 46.

Splice carefully the ends of the weavers. With the braiding and twisting it is best to turn in the ends of the spokes before attaching these weavers.

BORDERS WITH FLAT SPOKES.

For straight weaving, with splints, flags, palm-leaf, spokes thin and flat which will not easily crack when moist, fold and crease down straight close to the last weaver. Use always the underneath spoke to carry over the outer weaver and let the end hide and hold under the previous weaving. Turn, and work in the same way on the other surface. The spoke-ends cross two rows of weavers, and this extra emphasis is all the finish or border effect possible.

Or, an extra horizontal strip of splint or round reed may be carried all the way round for the spokes to loop over.

With palm-plaiting, where the strips cross each other diagonally, either the two strands fold over a fine reed in a straight line (bias to the edges of the strips), and each strand pushes under the weaving for a short distance when the ends are trimmed off;—

BORDERS

FIGURE 56. Or, cut the upper, crossing, light strand straight across and let the strand from the opposite direction weave down over this (dark side) into the web; draw tight and trim. Do not cut any strip until you are ready to bind the crossing one firmly over it. After this plain finish, the palm basket edge is usually rolled over, and must, therefore, be generous in height at the finish, to allow for such a hem. The hem may be moistened and pressed flat against a wooden form.

SPOKE BORDERS, ROUND REEDS.

The spokes may be odd or even in number. Cut a generous length, experiment with a few, determine the required length and point at the ends. Moisten the spokes, and work your thumb and finger firmly over each until it is pliable and able to make a graceful loop. Avoid too long loops.

FIGURE 57. Simple loop border. Insert each spoke next a succeeding spoke one inch under the weaving; the last spoke next the first. Spokes may lie under the next spoke, or over it, toward the right or toward the left; but, once started, are placed uniformly. If drawn close, the effect is of no border, extra pieces of reed may be inserted to make an elaborate finish.

Before turning for the loops, extra stakes may be added, if the ends enter the weaving for at least one inch. Make a ribbon loop.

A variety of effects are possible when each spoke is carried beyond the next one.

Alternate spokes may be long and short.

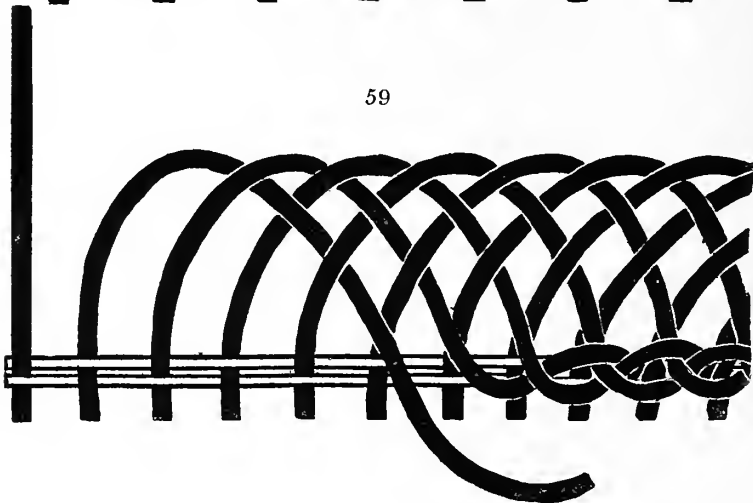
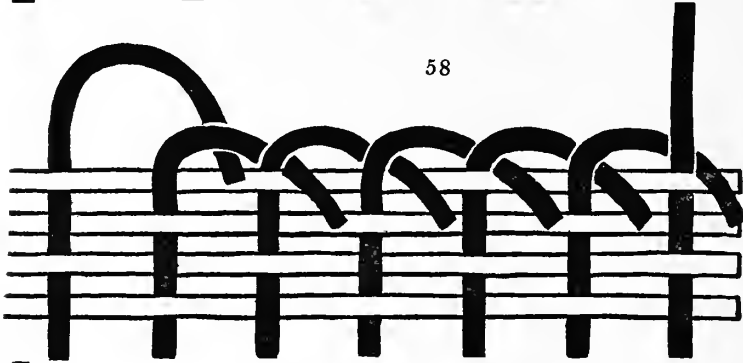
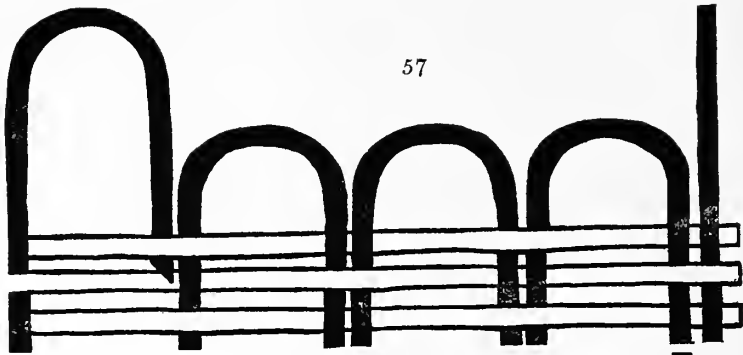
The looped ends may return to their own side in the weaving either free or after going around the next spoke. This border is so simple it is important that its relation to the solid portion of the mat or basket should be carefully determined and the position and curve of the spokes be absolutely uniform.

FIGURE 58. Rolled or rope borders with round reed spokes.

This simple method of rolling the spoke-ends has an even greater variety of possibilities, and can also be applied to splint, flag, raffia, reed-winding. Each spoke all the way round is

PLATE XIII.

PLATE XIII



57. Looped spoke border. 58. Rolled spoke border.
59. Madeira spoke border.

BORDERS

carried behind the next spoke on the right, and then out toward the worker. The last spoke comes out thru the loop made by the first one (in a circular weave).

The rolled spokes may proceed from left to right or from right to left; they may be carried behind the next spoke, in either direction, and then out; or they may be carried in front of the next spoke in either direction and project inside the basket. The spokes may be directed from below up, or from above down. Always a spoke-end should appear over every spoke in the basket. These may be cut slanting either inside or outside the basket; or, allowing greater length, may continue to form a more elaborate border.

A group of spokes may be added beside each spoke and the group treated as one spoke.

An attractive finish is to carry long ends (grouped) from a rolled edge down the outside of the basket; and near the base, insert them into the side weaving; or, if you prefer to make a low standard, let two rows of fine pairing hold the ends in place. Turn the basket upside down, carry each spoke over the next and thrust it behind the following spokes, toward the center, where it is trimmed off. The last group goes over the first and out behind. Be sure the ends have dried before cutting.

A shorter finish for the simple rope edge is to fill in the rope more completely and carry the last end over the next loop and then out to be trimmed, or carry the end under the next loop and cut slanting on the inside of the basket.

In place of carrying each spoke behind (or over) one (the next spoke), let each pass in front of or behind two, three or more spokes, uniformly, for one row. The last spoke-ends come under the first spokes, next the succeeding spokes in the basket (where the row started).

Allow long enough spokes, and this rope coil may be repeated two or three times. The twists may run all in the same, or some in opposite directions. Conceal all the ends.

When this rolled finish is applied to palm, splint or reed-winding spokes, the ends must be shaved thin. Cut a little

BORDERS

over an inch beyond the weaving and pass diagonally over the next spoke (on the right or the left), and trim inside the basket.

Sometimes a fine round reed is placed so that the spokes turn over it and the edge is thus more securely held.

As in our construction, we have winding, weaving, twining, braiding, so we can braid the spoke-ends in succession, one over the others. Groups of reed are always more effective than single spokes, and extra pieces of reed may be inserted to form them.

FIGURE 59. The Madeira Border often forms the entire side of the basket, and the extra spokes enter the base. Allow generously for the interlacing, when you cut the spokes. Hold the spokes out at the desired height for the border, then turn and weave over and under to the bottom, across the next spokes. At least 3 inches of the spokes should project outside, all the way round; one group-end beside a spoke-group in the basket. The weaving can proceed from right to left, or from left to right; over, under, or under, over. Place each group as carefully as possible from the start and it may cross any number desired. If the spokes are of fine reed, and the finish comes close to the weaving of the basket or mat, the ends may be reversed once or twice for two rounds of the rolled finish, and the points trimmed so that they are concealed.

If large reeds are used or the groups carry to the base of the basket, two rows of pairing should hold them firmly in place before the rolled finish. A single turning back will carry the spokes under, toward the center, to be trimmed.

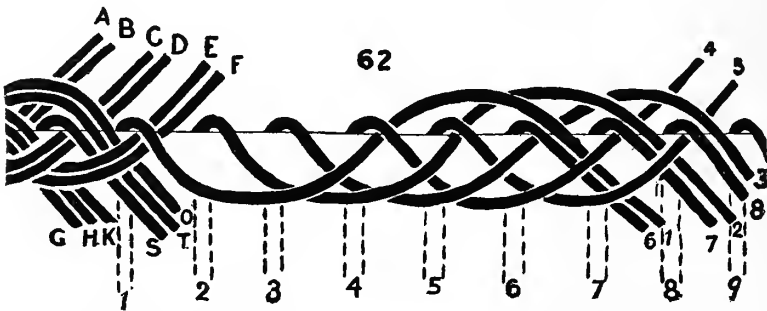
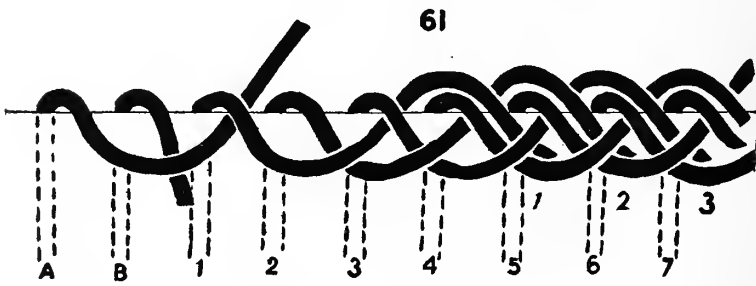
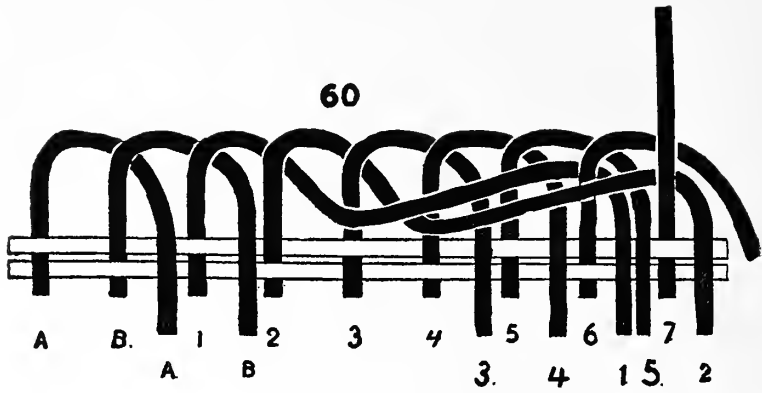
The Madeira weave may be open or close, and can, if tied while moist, retain a variety of shapes.

A group may pass over the next two groups, under two groups, and then over and under one, and out. Or, a group may pass over three groups, under and over two groups and then under, and over and under one group. In other words you can vary the plain braid and skip as is most effective.

FIGURE 60. The cycle border is a variation of the rope or rolled border. Carry 1 under 2 and out, 2 under 3 and out, 3 under 4 and out, 4 under 5 and out. Carry 1 over these and

PLATE XIV.

PLATE XIV



60. Cycle spoke border.

61. Shell spoke border.

62. Flat braid border.

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behind 6, out between 6 and 7. Bring 5 down next 1. Carry 2 behind 7 and out, 6 down with it. Continue thus, until A goes behind 4, left of 3, B goes behind 5 out to the left of 4. The reeds may be long enough to allow a second border or finish, which entirely conceals the ends.

FIGURE 61. The shell border of round reed spokes. A and B are simply brought forward, or down over the top of the basket, held in the left hand. With the right hand carry A over B and up inside the basket between 1 and the next spoke. Bring forward 1, 2; hold, carry 1 forward over 2, up between 3 and 4. Bring 3 forward over 1. Carry 2 over 3 and up between 4 and 5. Bring forward over it 4, and beside it 1, which is now finished under 3. Carry 3 over 4 and 1, between 5 and 6. Bring forward 5, and from inside 2. Carry up 4 over 5 and 2, between 6 and 7; bring down 6 and 3, and so continue around the basket. At the end, A over B, under 1, is carried down beside 2 under 1. B carried under A, over 1, under 2, finishes beside 3 under 2.

If a larger number of spokes are brought forward at first, carry the left spoke over and as more reeds are used the shell will be larger. One spoke-end is always dropped outside, under the shell and close beside a spoke in the basket.

FIGURE 62. The flat braid border should lie at right-angles to the sides of the basket. Bring forward and hold spokes 1, 2 and 3; carry 1 over 2 and 3, to the right of 4, inside the basket. Bring down 4 over 1. Carry up 2 over 3 and 4, between 5 and 6; bring forward 5. Carry 3 over 4 and 5, between 6 and 7. Bring forward 6 and then carry 1 (inside) over 2 and 4, down beside spoke 6. Carry 4 up over 5, 6 and 1, between 7 and 8. Bring down 7 and 2. Carry up 5 over 6, 1, 7 and 2; between 8 and 9; bring down 8 and 3. Now carry up 6 and 1 over 7, 2, 8 and 3, between 9 and 10. Bring down 9 and 4. Carry up 7 and 2 over 8 and 3, 9 and 4 between 10 and 11. Bring down 10 and 5. Carry up 8 and 3 over 9, 4, 10 and 5, between 11 and 12. Bring down 6, 1, 12, and 1 is finished, as 9, 4, 10 and 5 pass over it; work on with 12, 6. One spoke-end is now dropped beside each spoke in the basket.

BORDERS.

At the finish A and B come down with number 1 over C, D, E, F; A is finished. B is carried on with 1 over 2 and 3, under 4 next 6, finishes under 4 and 5. Carry G, H, over S, T, O, 1, B, A, under 2 down with 4, where H is finished and G works on with 4 and ends beside 9. Carry C, D, now over E, F, G, H, down with 2, down to 7 and 2. Carry S, T, under 3; work out with 5. E, F, are carried down with 3; E is finished, and F carried on to finish at 8 and 3.

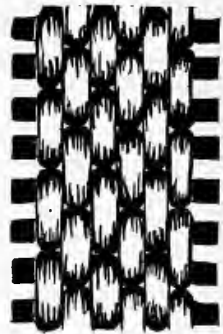
This, as is evident, calls for 10 inches or more of reed, when the spokes are fine and close together; more, if the spokes are larger and farther apart.

PLATE XV.

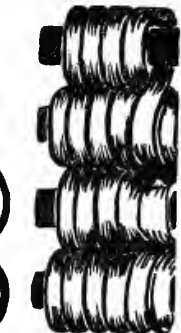
PLATE XV



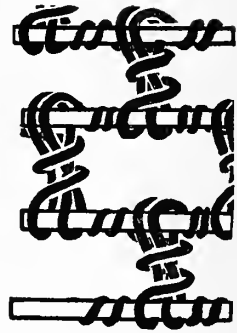
63



65

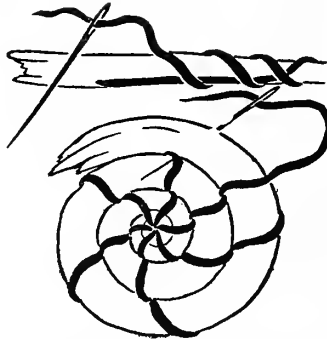


64



66

67



63. Close sewed stitch, cross-section. 65. Figure-of-eight, cross-section.
64. Long and short stitch, cross-section. 66. Knot or lace stitch, cross-section.
67. Ray stitch.

V.

SEWED BASKETS.

“The Greek worship or seeking was essentially of Rightness and Strength founded on Fore-thought. The principal character of Greek thought is not Beauty, but Design.”

JOHN RUSKIN.

Coiled work differs essentially from reed work, altho some of the same materials can be used in both. We have in reed baskets many short free ends played over by the spirally ascending weaver. In the coiled basket, as in coiled pottery, we wind a continuous coil, which must be held by stitches as the pressure and moisture hold the clay. There are but few stitches, yet in many ways these can be varied and combined.

Coiling is the great grandmother of modern sewing. The Indians make a hole with a thorn or sharp bone, and thru this direct their thread of grass or sinew. In modern sewed basketry we use raffia, a needle, and for the coil, twine, rope, raffia, reeds, grass. We can start with raffia, and later cover our coil with grass or insert a reed to stiffen it. In the close-sewed stitch we must always retain a little grass or raffia on the reed for the needle to pass thru. If the coil is of grass or raffia, new material must constantly be fed in under the last stitch to keep the coil uniform.

Never use a knot to join the threads, except when absolutely necessary, as in ray stitch.

Keep the work firm, so that one row can never slip up on another.

Raffia must be kept for some time in a wet cloth. Never work with it full of water—it will stretch when dry. Keep the raffia smooth and glossy.

Design forms for the baskets; colored paper silhouettes or card models with desired curving sides. For patterns, use

SEWED BASKETS

the point edge sheets and draw horizontal and vertical lines, or for round bottoms concentric circles.

Plan for the width of the stitch to be half its height. In the lace stitch use the lines as a guide, but in close stitches fill in the spaces between the lines.

Figure 67 on the plate gives us the simplest way of starting our coil. Use a bunch of raffia, cut ends even toward the right; thread a needle with raffia (large end); place the fine end toward left over the coil, about 2 inches. Hold in the left hand and with the right wind away from you, and from the right, 4 or 5 slanting stitches. If the thread lies too straight and firm you cannot bend the coil. With your right hand twist this small end under; your thread comes from the center, where there should be no hole, and you proceed to sew over the two coils and into the center. Except in the ray stitch, figure 67, the first two coils may be closely covered.

FIGURE 63. Close-sewed stitch with cross-section. As soon as the start has been satisfactorily made, round reed may be inserted under the raffia, and each row of stitches sews into this previous coil and thru the previous row of stitches. 8-ply tubing (a rope of slightly twisted yarns), rope, or grass may form the coil, which the stitches completely cover. Plan patterns in a different color, avoid continuous unbroken lines, as the start and end are conspicuous. Broken line designs are best. Fold paper discs in thirds or fifths, or sixths from the center. Cut patterns parallel to border and on radiating lines from the center, open the circle and notice how the units are distributed. Plan borders on squared paper, twice as high as width of stitch.

Raffia of different colors can be carried on top of the coil and brought to the surface at any point, when the last thread returns to the coil. Start new thread in this way without knots. Keep the lines between the rows of stitches or coils clear, occasionally the raffia may wind about the coil if stitches keep the work solid.

To finish off the edge trim your coil down as thin as possible for at least an inch; let your stitches include this

SEWED BASKETS

trimmed end and the last row of coiling below. Hide the end of raffia underneath in the coil.

FIGURE 64. Long and short, strap, or lazy squaw stitch, cross-section.

Two strips of Number 1 or 2 reed make a good foundation, easier to coil than the heavier reeds. Lay the end of raffia over the reeds as in ray stitch, curl the end under and sew close from the center. When once around, wind twice about the last coil and then take a stitch over the coil and the previous row. A great variety of designs are possible in one color if the mass for the long stitches is varied on the spaces for winding. It is not well, except when using flat reed, to wind more than 1 inch without stitches. A variety of designs is possible with two or more colors of raffia. Plan the designs carefully on squared paper in order to have the effect of the stitches clearly understood. Design borders for the sides of the basket and half-circles for the bottom. Fasten off the last coil, as in close-sewed. With this stitch sometimes a piece of reed long enough to go around the top of the basket is trimmed at both ends, so that a complete uniform ring is made. Let this be sewed over the finished edge and conceal all change in stitch.

FIGURE 65. Figure-of-eight stitch, cross-section. Modern workers have named this the Navajo stitch, but the best authorities say that it was only used by Indians to border some baskets. It is undoubtedly the stitch most successfully used by our girls' fingers. It is more easily kept perfectly smooth and even, altho it takes longer, because each stitch thruout (except on the last row) works over a previous row of stitches.

Work from left to right, after the start of the coil in the center with raffia or fine reed, or grass, bring the thread from the center over the last coil to the back between coils, up the back of the new coil, down over its front, between the coils, into the center, or under the last coil and so up again to the lower surface. Continue thus curling in the line of a figure 8.

To join raffia, place new end on the coil, bind over it until the short end is turned under, and the new strand takes its place. Any number of colors can lie on the coil and come

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to the surface whenever a design calls for them. Remember, your next row will completely cover the last row of stitches.

Figure-of-eight stitch easily combines with any of the other stitches for new effects in design. It is the best way to start an oval basket or tray, whatever stitch may be used afterwards. Fold the reed back on itself the required length of the center. Start your raffia with the coil at the turn, bind firmly and then form figure-of-eight stitch under one strand over between the two, down under, then over the second, down under and over the first. No needle is required until you turn at the corner and start the next row of stitches. Make both ends as absolutely alike as possible. When planning for sides to your basket turn at the last or cut end of the center.

Make designs on squared paper for borders and centers, Make card models for baskets.

FIGURE 66. The knot or lace stitch, cross-section. This is most successful when only a small space lies between the coils; in the diagram the enlarged drawing seeks to make the construction clear. As we are familiar with the long and short and figure-of-eight stitch, one can easily see if either of these long stitches were left a little loose the raffia might turn to wind about the stitch, between the rows of coiling, and thus make a firm bridge. The upper coil has the raffia wound closely about it, and at intervals a pattern is formed by these tiny bridges, which start either with two long stitches or two figure-of-eight stitches bound together.

Attractive mats or covers can be made for caseroles, pudding-dishes, Boston bean jars, flower pots.

Design carefully on the lines of squared paper.

Different colors may be used, but generally one color is most effective, when form and pattern have received the most attention.

The separate outer ring best finishes this edge. Any of the other stitches may be used for a closed bottom, and only the sides or border finished in the lace stitch. Boxes for collars, cuffs, handkerchief, gloves are easily made; also, trays for pencils or jewelry.

SEWED BASKETS

FIGURE 67. In the previous examples 63, 64, 65, 66, the coil has been entirely covered by stitches close together. The ray stitch, is worked like the close-sewed, but the coil is held by as few stitches as possible, and is the most beautiful part of the basket. Grasses, sedges, corn-husks, pine-needles, sweet-flags, rye or oat straw, or raffia covered with any of them, make excellent coils. The Kentucky blue grass when ripe, is a beautiful gold color, and the Maram or beach grass gathered in the summer dries in fine light green wires. The stalks of grass must be fine and very pliable, altho they usually require moisture in a damp cloth before using. Gather the grass in summer, clean off the roots and broken ends, and when you work with them, arrange beautiful colors most effectively. The corn-husks require to be laid straight and smooth over a coil of raffia or tubing.

To sew the coils together use raffia, or heavy carpet thread, or from the North Plymouth cordage works, Plymouth, Mass., procure unlaidd Manila hemp fiber. As this fiber has not been spun, eight or twelve strands may be necessary for one thread.

After the first coil has been started and the stitches evenly spaced, continue to guide your stitches by those already in the work. Carry the needle into the coil, slanting under the stitch on the last row. Pull the thread firmly over the coil and first finger of your left hand. The loose end of the coil should remain free. As soon as any space between stitches becomes too wide, if the stitch below has too long a slant, make a new stitch in the coil. Let them radiate evenly from the center, but a curved line is more beautiful than a straight one. Keep the coil uniform in size by adding new material under the last stitch, whenever necessary.

Notice that unlike the other stitches, which are the same on both sides, here we have a right and wrong side. For an open tray or saucer-shaped basket, keep the right side inside, and your needle working from that side thruout.

If you are to make a bowl-shape, or one whose sides round in, let the center start be on the right side. Then at the completion of a few rows, opposite the first stitch, turn your work quite

SEWED BASKETS

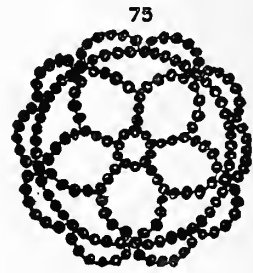
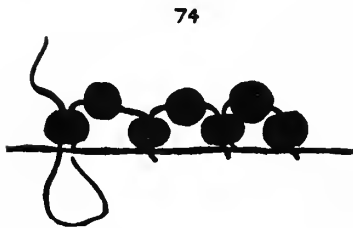
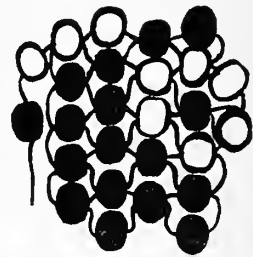
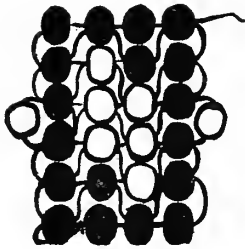
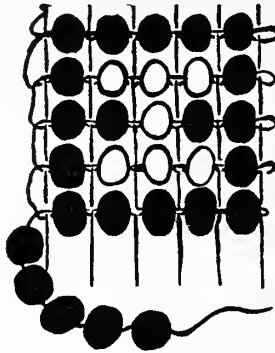
over and let the coil and stitches now work in the opposite direction. Two full rows should be completed before the basket begins to model up with your stitches now on the outside. Make all necessary additions in stitches here, so that new starts will not be required on the side of the basket.

When joining the thread or raffia make a flat or weaver's knot close to the previous coil. Do not cut the ends off, but let them work in with the coil. The final end of the sewing should be entirely concealed. Gradually trim down the coil and let the last four or more stitches lie absolutely over those on the previous row; run the needle into the coil at the back and trim off.

Make card models for delicate forms and arrange carefully any contrasts in color, as straw with pine-needles or corn-husk with grass.

PLATE XVI.

PLATE XVI



68. Two-strand chain.
69. Open chain.
70. Daisy chain.

71. Loom weaving.
72. Straight free sewing.

73. Diagonal free sewing
74. Bead edge.
75. Bead rosette.

VI.

BEAD WORK.

"To give people pleasure in the things they must perforce use, that is one great office of decoration; to give people pleasure in the things they must perforce make is the other use of it."

WILLIAM MORRIS.

Bead or point construction offers, in the younger grades, a special opportunity for counting, repetition of definite measures, and thus a delightful introduction and familiarity with good color. The simple stringing of beads in the first grade, includes repeating in alternation the same number of beads in two colors, different numbers of beads in two colors, different numbers for three or more colors. By looping the chain at given points you discover a variety of effects. With the plain stringing, make a necklace with an irregular repeat from the center. Bead necklaces form an excellent introduction to the later study of jewelry.

FIGURE 68. A simple chain starts by tying on the first bead (which in bead work proves inevitable); a single dark bead is followed by a single light one, until the length is right. Leave the beads rather loose, return from a dark bead, string on a light one, thru the dark, and on a light one, until completed. Any number of beads may occur between the beads taken up. This can easily grow into a bag or purse, with or without a silk lining. Our grandmothers made exquisite collars in this way, definitely shaping them by count.

FIGURE 69. This chain is worked with two needles, threaded on both ends of silk or cotton. Wax the thread. Instead of entering a given bead from the same direction in which it was strung, let the second needle enter the bead from the opposite direction and the needles cross in the middle. A variety of designs are here possible.

BEAD WORK

FIGURE 70. With a single string of beads we sometimes wish to carry the straight line and vary it with a flower effect. The daisy, or forget-me-not, have been especially successful. After the straight line, string on eight white beads, carry your needle and thread thru the first white one in the same direction it was strung. Take up one yellow bead for the center, pass needle thru the fifth, or opposite bead, and string the plain color again. If you prefer, the needle may return thru 1, 2, 3 of white, string on yellow bead, pass in opposite direction thru 7, 6, 5 and again the straight line.

There are several other ways for constructing the flowers; pupils can experiment with two or three threads. In all cases of stringing have the thread as strong as possible. Glazed Kerr's cotton, black and white, and ordinary sewing silk are good, but it is better to always wax these. With one strand, an occasional knot made in the thread helps the beads to lie loose and lightens the strain on the thread. The size of the beads determines the size of the needle, and this of the thread. Bead needles, finest size, are No. 16. If silk can not be found fine enough for smallest cut beads on canvas, use close twisted fine number of Battenberg lace thread.

Fringes of beads should never have their threads cut at the bottom. Return the thread a second time up thru the beads to the heading. A loop, or a daisy, or a larger bead may uniformly or occasionally finish the ends of the fringe. Different color beads may be scattered thru those of another color.

Block-building for design becomes the basis for cross-stitch patterns in embroidery, or is gradually evolved toward mosaic effects in the later grades on point edge paper.

FIGURE 71. The simplest method of design, and, perhaps, for construction also, in all-over surface patterns, is to stretch warp or vertical threads on a card frame or on a simple bead loom. On the card the threads may exactly fit the dimensions of the piece of work when finished. If a loom is used, the cut ends of the warp will have to be fastened off and bound in some way. Make your design on the squared paper, let a

BEAD WORK

thread of warp represent the vertical lines between every two beads and on the edges. These threads may be a little heavier than the silk or thread you sew the beads with. Tie the sewing thread, well waxed, to the upper left warp strand. String on it the beads called for in sequence, from left to right on the uppermost row of the design; carry the thread under the warp a bead between every two strands. Bring the thread over the right warp end and pass the needle back thru each of the beads in succession. Each warp thread will be crossed by two weft threads, one above, one below, held by the beads. Chains, four or five beads in width, with repeats of small units, are good exercise in design for the third grade. If the beads are strung on in the beginning the warp may carry them at intervals between the close weaving. Purse, card-case, book covers, candle screens and lamp screens may be made, as well as belts, chains, etc., etc. Study color effects closely; some of our imported porcelains or pottery often given beautiful color schemes. Extra beads may, if desired, give a pico edge effect to the solid surface.

FIGURE 72. The same method of design may be applied to the free weaving or bead work without a loom. String up the first row of beads from left to right, tying the first bead on the left. The design in No. 71 might have an odd or even number of spaces across—here one works best with an even number. String on the first right bead on the second row, carry thread thru the next to the last bead on the previous row; string a bead, carry thread thru below and with an even number the needle will hold the first bead before returning to fill in the second row. One thread carries straight, and the other alternates between two rows. Extra beads may be added on the edge for pico finish. Design on the straight squared paper; in the younger grades the children can make articles with large sized E beads, and in the upper grades use the fine cut glass ones. There are no ends of thread to be considered, as in the warp strands above. When threads are to be joined, sew thru several previously secured beads, make a weaver's knot, figure 93, and let the last end pass thru several beads

BEAD WORK

before trimming off. After a center has been constructed, a border may be worked, carrying thread and stitches all the way round, then the side beads will lie in the opposite direction. The play of light and shade on beads thus placed is noticeable. Fine wire may be used instead of thread in this construction.

Similar to the last in construction, but different in design, is the diagonal free sewing. No loom is used. In the design the squared paper is turned diagonally, and very different effects are produced from figures 71 and 72. Every alternate bead or space is on a line, but the spaces between halfway above and below. In the younger classes, experiment for effects with the beads; in the higher grades, make good designs before starting the work.

String loosely an even number of beads, add one bead for the right second row (two beads at the end or turn). Carry the thread thru the next bead, string on one, and so on to the first bead. Turn and alternate, taking on bead and passing thru one on the last row. Design chains, bags, purse and card-case covers, screens, belts, etc., etc. Wire may be used instead of the waxed thread.

Figure 73 gives us the adaptation of diagonal sewing to the daisy chain. After one white bead appears on the right edge for the lower petal in the daisy, and one white bead on the next row at the left, inside it; string on one white and one yellow as your thread comes thru the lowest white petal. Carry thread thru the left white, work to the left edge and back; next time, after passing thru the yellow and previous white, string on two white beads, enter the upper white bead on the left and so on across. If the beads are too irregular for this construction, the four inner beads of the petals and center are sometimes finished before the thread, as it comes thru the upper white bead, strings on four white beads for the outside, carries thru the lower white petal and works back to the upper bead again.

These little flowers may be scattered thru the chain in many different groups or ways. Sometimes there is no ground work and daisies fit close from opposite edges. In the upper classes make a good design before you begin.

BEAD WORK

Patterns of single units of beads may be scattered over a background of silk or canvas. Design carefully on point edge squared paper, sew the beads on and study best effect as to the direction of thread as each bead is sewed one at a time.

For all-over bead-work on canvas, etamine, etc., the waxed thread should be worked the reverse of ordinary cross-stitch on Penelope canvas. On the upper or bead surface carry the thread straight, vertically or horizontally, according to the best effect for the beads. Underneath let the stitch slant diagonally. If you cannot keep the direction uniform when you work over and back, fasten the thread each time and work always from left to right, or vice versa. If the beads are so irregular that the canvas shows thru in spots, with strong water color, you can stain the canvas from the back. Brilliant colored sewing silk varies color effects in transparent glass beads.

Beads of one color may be strung on silk thread for knitting or crochet before the looping is begun. With a plain or fancy ground, as the design calls for it, let a bead be pushed in front of the needle before the next stitch is made. Design on fine squared paper; in double or triple crochet two or more beads may be required for a stitch. This is good work, simple in design for belts, bags, etc., etc.

When the knitted or crocheted bag is to have an all-over pattern elaborately designed on fine squared paper, like our great grandmothers' exquisite bags and purses, make a very careful design. From this design count and string beads carefully, row after row, so that no mistake can be made in placing of any bead, then proceed to knit or crochet, pushing always a bead forward at every stitch. In mending bead bags use the vertical threads and Jersey stitch with bead over it, as in diagram for wrapped stitch, 50.

Leather is a most delightful background, apart from the primitive colors and geometric designs of the Indian work. The latter is most successful and interesting in its use of stripes or bands of five beads. The spacings between the stripes are very effective and their division of the continuous

BEAD WORK

line into broken parts. Sometimes only one color is used (for this, turquoise seems the favorite) in the beads, but where narrow bands edge the moccasins, bags, belts, etc., simple patterns are most effectively worked out.

The bands of ornament on the Egyptian mummy cases are suggestive for such designs, and the color is rich.

The silk for sewing should be waxed, but it need not go thru the leather or show on the other side.

Leather hunting bags, vests, etc., are often covered all over with the stripes, but a civilized man would find such garments rather too heavy for comfort.

When you prefer to fill a space solidly and use neither knitting, crochet or cross-stitch, make your design carefully on fine squared paper and use some strong fabric or leather as a foundation. Stretch your thread from the left; where it has been fastened, string on the beads from the design in sequence from left to right, first row. Pass your needle into the leather on the right, do not crowd the beads too close. Bring your needle thru the leather under about five beads, then to the surface, carry it thru a few beads and again under the next group thru the leather. String each row from the left and fasten on the return from the right. There should be no break in the line or surface of the beads—all lie perfectly smooth, and avoid overcrowding. Large medallions or designs with a rich variety of color, can thus be effectively worked on leather bags, pockets, etc.

In smaller designs on leather the effect is often better when the direction of the strings of beads vary. Design freely without squared paper, transfer the design to the fabric or leather. String the outer line of beads, or any special group you wish, fasten the beads, as before, running the thread under the leather then up thru the beads. Place row next row as the design requires.

Sometimes in all-over design, the border or special parts may be worked in different ways from the background or other parts. This does not imply carelessness, but requires increased thoughtfulness and great care in applying the design.

BEAD WORK

FIGURE 74. In the lower left corner of the plate is a method of finishing the edge of leather or cloth with beads. At first, string on three beads, stitch thru the edge from the back, carry your needle thru the last bead, string on two more and repeat. More elaborate edges may be designed with more beads.

Edges of leather as on bags, pockets, cases, flat or edge seams, can be effectively bound with stitches close together, carrying four, five or six beads, which make a very solid binding. Indians vary this by changing the color of the stripe. The ends of leather thongs used for lacing, or as a draw string, may be thus finished; also the heads of tassels.

A single bead sewed over the edge at close intervals, protects leather and prevents its tearing or stretching.

Instead of punching holes or cutting leather for a draw string, the bag may have short bands of beads, at regular intervals, for the string to run thru. It is best to use fine wire rather than silk, but it can pass thru the leather and is nowhere evident.

Groups of beads in a straight line, vertical or horizontal, at scattered intervals, below the cut upper edge of the bag, protect it very much if you do not wish to have a bead binding.

FIGURE 75. With fine wire, such as florists use in short lengths (the spool wire must lose its curl), rosettes of beads in great variety can be designed for buckles on belts, ornaments on bags, bottoms of baskets, etc., etc. At the Natural History Museum, in New York, a large collection of Mexican bead work includes many rosettes which might serve as watch pockets with silk linings.

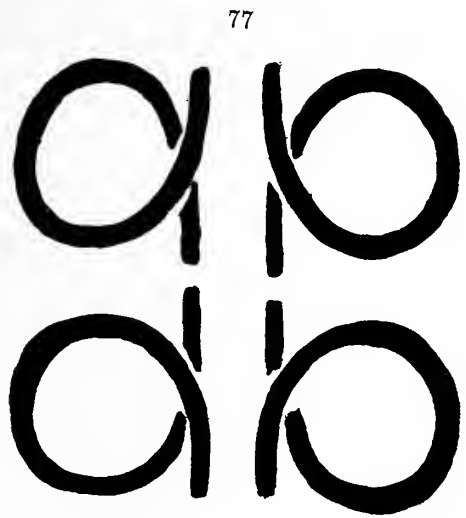
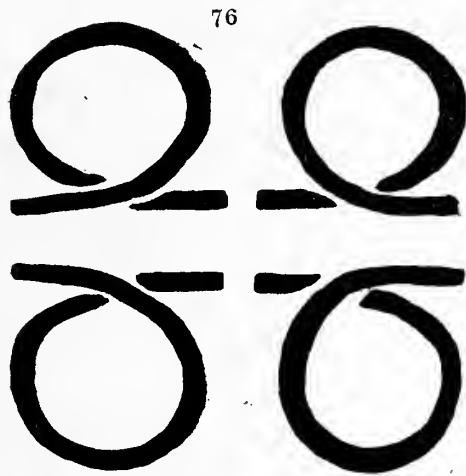
The wire can be joined easily by twisting one thread over the other and then drawing up and concealing the join under the beads.

The beautiful rose windows in European architecture, and exquisite lines in medallions of lace, are full of suggestion for design. A third-grade class with large E size of beads, two colors, will be able independently to produce a great variety of inventions.

BEAD WORK

As pockets and bags, moccasins, etc., are important among objects made in leather, pattern-making during the application of these problems in design, should include careful designing and making in paper or muslin of bags, shoes, purses, pockets, of every description. Caps and mittens might easily come under the head of bags; inventions in this direction disclose the origin of most of the picturesque, yet simple peasant caps of Europe.

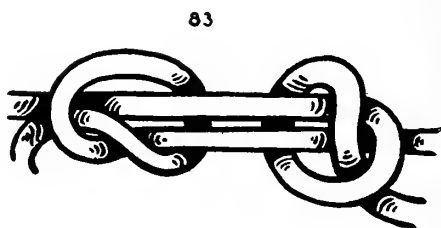
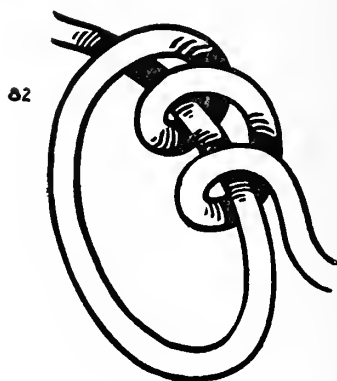
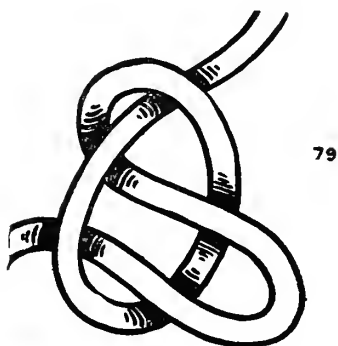
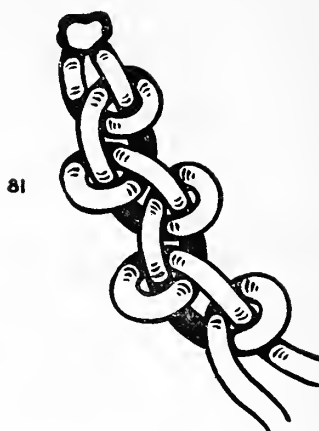
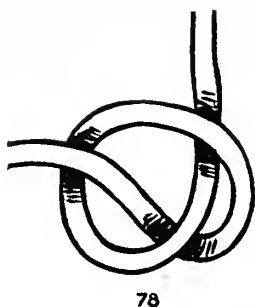
PLATE XVII



76. Horizontal loops.

77. Vertical loops.

PLATE XVIII



78. Simple running knot.
79. Loop knot.
80. Slip loops.

81. See-saw chain.
82. Two-fold knot.
83. Fisherman's knot.

VII.

KNOTS.

"It is more than probable that some mechanical necessity gave rise to all geometric pattern; certainly it is impossible to plait, net, knit or weave, or otherwise mechanically make without producing pattern. It may be infinitesimally small, even invisible to the naked eye, but it is there; and out of the determination to make the best of it has grown much of the most beautiful pattern-making."

LEWIS F. DAY.

Having practised with flexible, passive vines and grasses, weaving about fixed stakes in fence-making and basketry, it is quite natural that men learned to twist fibers and spin for themselves endless threads. A long playtime with these has developed a wonderful variety of construction. "Knots," we say, "are as old as fingers," but as we separate and examine the wonderful lace-bark, or the curling wool on a sheep's back, it may be Mother Nature really contrived them long before. In "Mr. Isaacs," by F. Marion Crawford, we read, "It is singular how the unaided wool can tie itself into every kind of a knot: reef, carrick bend, bowline, bowline-in-a-bight, not to mention a variety of hitches and indescribable perversions of entanglement."

The Old Testament tells of nets and snares, and Homer's travelers secured their treasures with intricate knots, forestalling the invention of locks, safes and padlocks. The string with a knot in it may have preceded a consciously constructed nail or screw. The witches of Lapland sold to sailors "wind knots," tied by enchantment in ropes which when untied, were warranted to cause certain winds to blow. Knots were used in South America, and among some Western tribes in North America, as a language thru which to send messages from one chief to another. The strings were of different symbolic

KNOTS

colors and each knot had its own significance. To-day, I am told, Japan has an elaborate code of etiquette practised thru knots, which convey messages of condolence or congratulation. The East, both in China and India, furnishes us with beautiful decorations in silk; heavy cords for temples, and trappings for horses. Many of these, perhaps the Crusaders brought to Europe, for we find them in stone, Celtic crosses, architecture, wood, scrolls, illuminations, iron work and heraldry of the Middle Ages.

Fringes and knotted garments were worn by Assyrians and Egyptians, as their stone walls tell us, but the true art of lace-making is a late development, and arose from the manufacture of fancy gimps and galloons used to border the brocades and heavy draperies of the 15th and 16th centuries. Macramé lace originated with the Moors, Needle lace with the Venetians, and Bobbin lace in Belgium. These have developed independently and thru them, the art of design so exquisitely cultivated, has inspired the most beautiful decorations in stone and iron, etc., etc.

Sailors, builders, fishermen, weavers, basket-makers, as well as conjurors, have constantly practised a variety of knots, which, to-day, are not neglected in the training given to our navy and army men.

We have in ropes or string a line with two ends or points, and a continuous stretch between them. The first end (usually fastened) sailors call the "standing part" of a rope, and the "bight" lies between this and the "end." A knot is an interlacing of string over itself, used to shorten, to strengthen or to decorate. A tie is the crossing of two ends in a knot to join them together, used to hold them fast, allow one to slip, or also for decoration.

Fibers slightly twisted form yarns; two or three yarns form a strand, three strands usually a rope, three ropes or nine strands, a cable. If the elements have been twisted toward the right the next combination twists toward the left and vice versa. In shroud laid rope, three strands are laid about a fourth or central strand. There are

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also solid and hollow braided ropes—the latter in cotton lacers is the best strand for children's work. Children can make a cord or rope with any number of strands. Let two of them take the ends, stand as far apart as possible, each twist his end in opposite directions, and the teacher's finger often run over it to keep the twisting even; especially, after the two ends are knotted together and the cord begins to creep up.

A knot usually constructs for strength, but it may be inflexible or elastic; and two or more ends may be so tied as to form chains, surfaces, bags; or, in looping, may net, knit or crochet a great variety of coverings in different shapes.

More or less space intervenes between knots, and therefore in designing for these subjects, use the point edge cards, dividing the surface into rectangular or diagonal lines, and working on these lines for the stitches.

To register a curved line or loop, we start with the fixed relation of two straight lines, vertical and horizontal, crossed at right angles in the center. To make a circle, start at a given point or distance from this center, multiply the number of points by infinity and carry the line round until it loses itself in its start; and there is no beginning or end ever after. In loops "the end," as the sailor says, "crosses over the standing part;" we notice the direction from which our line started, and that toward which it is travelling. The simplest loop may assume one of four vertical or four horizontal positions.

FIGURE 76. In figure 76 we have (in the upper left corner) a horizontal, left, overhand loop; next, a horizontal, overhand loop toward the right. Below on the left, an underhand, horizontal loop toward the left and a horizontal, right, underhand loop.

FIGURE 77. A vertical, left, overhand loop; a vertical, right overhand loop; a vertical, left, underhand loop; a vertical, right, underhand loop.

We start always from the center and name the overhand, underhand loops according to the directions they assume.

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From the teacher's drawing on the black-board the child can, in the primary, with paste-brush and string, describe circles and loops on folded paper; in the older grades, name the drawings, made with crayon, brush or pen.

FIGURE 78. The simple running knot, "around, over, under and out thru the loop," may vary as to eight directions. The sailors' description is to "pass the end of the rope over the standing part and thru the bight." Besides being drawn from the standing part in any direction, it may also be carried "around, under, over and down thru the loop." In the youngest grades heavy cord, rovings or lacers may be given the children to divide in halves, quarters, etc., and a knot made at each point. Take a longer string and make knots an even distance apart, measured first by the fingers and then by the eye. Pull tight when in the right spot. A two-strand running knot may tie the ends together and thus form a chain or lanyard for whistle or knife. This is the simplest knot for making dolls' hammocks or bags with raffia, cord or lacers. A double loop knot is formed when the loops pass thru the bight.

FIGURE 79. If the loose end is doubled, and pulled thru the simple running knot, we have the simple loop knot. In the younger grades this is the beginning of the looped or crochet chain. Children like at first to use their fingers (especially with cotton rovings) and as each loop is finished, draw another loop thru it; until "the end" passes at last. Whistle chains, horse-reins, etc., are interesting. In the third and fourth grades a hook may take the place of fingers and crocheting developed. A simple problem is a cotton crochet net edge to a doyley. The border may be designed with different sized nets of chain-stitch. Design on the half-circle and on the square with straight and diagonal lines, and do not let the line be broken or removed from the paper. When desired, any spaces may be filled with triple crochet stitches. From simple pattern-making in the third and fourth grades, dolls' sacks, shirts, caps, children's mittens, and slippers of wool may be made. Be sure the child makes the paper patterns and conforms the simple stitches to the shape. Last of all,

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wonderful designs in Irish lace are possible. Crocheted silk bags or purses are delightful problems for the high school, with designs of colored stripes and simple repeating units. Beads may be used as suggested in the Bead chapter. There are many books on crocheting published by the manufacturers of wool, cotton or silk yarns and threads. Choose wisely what is educational.

Knitting in the second grade may again attempt a long chain with the heavy cotton rovings. Two fingers at least must have the thread hitched about them, pass the roving above one loop, which slips over it; the next loop again passes over the roving, and so back and forth. This is the beginning before the spool or toy knitter. Children may bring from the woods or the work-shop, a small two-pronged stick, or may bind three sticks together with raffia very smoothly, so that two points project beyond the center. Watch chains, or fan chains can be made with silk or mercerized cotton.

In the fifth grade use two needles of steel, bone or wood, according to the size of the yarn or the mesh in knitting. Diagram 50, without the vertical lines, gives a fac-simile of plain knitting. Purling and plain knitting, knitting two stitches together, and winding thread over the needle, give us different patterns. Design on point edge squared paper. For purses, pockets, etc., etc., different colored stripes may be designed.

For setting up knitting there are many different directions; the simplest, loop one stitch at a time on the left hand needle which the right hand needle knits off. For mittens and stockings, etc., four needles should be used.

Manufacturers of threads supply many knitting books with patterns.

FIGURE 80. The slip loops, Macramé knot or beading, so constantly used in that lace over a foundation-cord.

After winding thread on a bobbin, it slips once thru in this way, to prevent the thread unwinding too fast.

With cotton lacers, children in the second grade, can make mats or baskets either with or without a foundation strand.

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As in crocheting, if the tip enters under the crossing strands, the work holds more firmly. The increase of stitches for a circle may be planned: every other row make two new stitches in one of the last row; the alternate row plain. Or, once in three stitches, an extra stitch added; or, at four or five points always increase on each row.

A great variety of stitches are possible, with different sized loops and groupings, all that needle point and tape laces have successfully developed in fine threads. Mrs. Walker, of London, in her "Occupations in String Work" (MacMillan & Co.), has elaborated a course thru all the grades, giving a successful evolution of problems in Macramé lace. The different bars, spiral, Genoese, etc., are excellent for handles for knotted bags, and may be easily evolved by experimenting with cord over heavy reed, for children's home practise. A uniform repeat of any simple looped effect is good, and two strands make heavier handles or bars.

With a needle and thread, this simple blanket stitch has been used largely in cut work, embroidery or Roman lace. A working drawing proves this stitch the same as the Mohave, wrapped or Cashmere weave.

After the experimental stage, apply all this work to carefully made designs.

FIGURE 81. The see-saw chain is a simple development with two strands, each alternately looping over the other. Useful in heavy silk, or mercerized cotton, for fine chains; in raffia or cord, for Macramé lace bars.

FIGURE 82. In the twofold, three or more fold knots, the "end" crosses twice or more around the "bight" (or first loop) before nipping or drawing tight. It is useful for stopping a rope or cord from passing thru a hole; for decoration on a single strand, or as a French knot in thread or cord on paper or cloth.

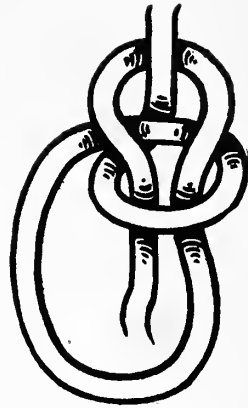
FIGURE 83. The fisherman's knot, for joining two strings or in reed work, for decoration. Make simple running knots with the end of one string over the end of the other. End 1

PLATE XIX.

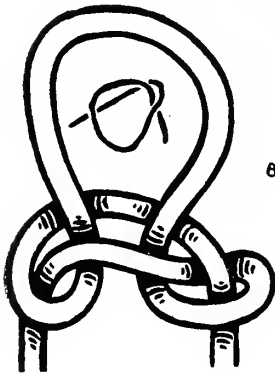
PLATE XIX



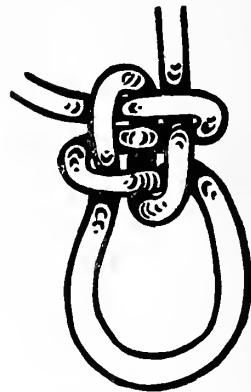
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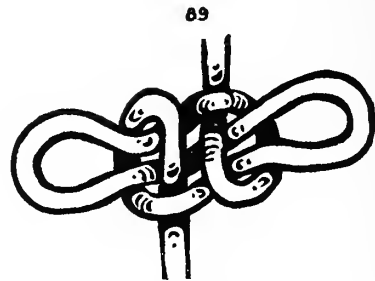
85



88



86



89

- 84. Figure-of-eight knot.
- 85. Harness hitch.
- 86. Bowline-in-a-bight.

- 87. Standing bowline.
- 88. Square knot.
- 89. Looped square knot.

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ties over string 2 and 1; end 2 ties over string 1 and 2. Extra strings may be introduced between the knots. Draw the long ends tight, and the greater the strain, the better the hold.

FIGURE 84. The figure-of-eight knot, sometimes called the military knot, is used largely in decoration; with braid on uniforms; in reed work; and in heraldry is carved on many cathedrals in Europe. Cross over the standing part, continue under it and return thru the first loop, forming a figure-of-eight.

FIGURE 85. The harness stitch holds tight as a loop and is decorative and simple to construct for shortening. The small drawing within shows the first step. From the lower right end make a large vertical, left, overhand loop, carry the end diagonally under it to the lower left corner. Pull the lower larger half of the circle (which lies below the crossing) up under it and out over the top of the loop.

FIGURE 86. The bowline-in-a-bight is another firm loop if properly pulled with a little jerk, which prevents the strands from lying too straight at their crossing. Work with the doubled or loop end of a strand. Make a small left, vertical underhand loop and bring the doubled or loop-end up thru it. Now carry the whole knot thru this loop, or as sailors say, "cast the bight over the whole." Pull tight on the larger loop.

FIGURE 87. The standing bowline is constantly practised by seamen and should hold firmer, the harder the strain. In tying up parcels it is useful, and wherever a strong loop is required. The upright end is here the standing part. Make on this a small vertical, right, underhand loop, weave the end up thru this, out, under the standing part, then down into the loop, and pull tight the larger loop.

FIGURE 88. The square knot may be made with two ends of one rope forming a loop, or it may tie two ropes together. The right upright strand is the standing part; pull on this and carry the bight next up and then down on the left. Form the lower loop, or bring the other end, under the standing part, over the bight, under the whole and above over the standing part and thru the left loop. This is decorative for use in braids or reeds, and holds tight.

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FIGURE 89. The double-loop square knot is used a great deal in India and China for decoration, and in Europe we find it in heraldry, stone carving and wrought iron. The standing part is on the upper right. Make a small, underhand, right, vertical loop; with the end make a loop on the left. Loop a second time toward the right and slip this last thru the small vertical, underhand loop. Carry the end now from the middle, under the left loop, over it, and down thru its own bight.

There are many simple nooses used by sailors to fasten ropes around something. In most of the knotted work for bags, lace, etc., the strings are fastened to a line or ring. The bags may start from a small ring at the base; several small rings, or one large one, at the top; from a foundation cord or from two sticks, for the top. The finish at the opposite end must be planned before the bag is started. Let the children experiment with nooses and slings.

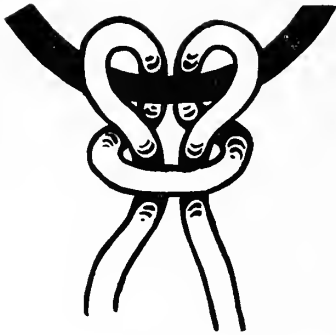
FIGURE 90. The knotted-on loop in Macramé lace. Fold each string double and bring the two ends under and over the foundation; then down thru the loop. In the reverse, the two ends pass first over the foundation, then under and out thru the loop. In Macramé lace a second foundation-cord lies close and parallel to the first. Each end forms two Macramé knots on it (as in figure 80). Certain strands are selected as foundation cords, and the others knot over them in bars or diagonal lines.

FIGURE 91. This netting or hammock knot is copied from the needle-made net, and not the usual shuttle netting, which, altho similar, is more complicated. Wound on a wooden needle or stick, the continuous thread constructs a series of meshes, which can be of different size according to the mesh-stick used for making them. There must be a foundation strand to fasten at least the first mesh to, and this is called the saddle. Must be firmly fixed somewhere to a hook or weighted cushion, so that one can pull with all one's strength against it.

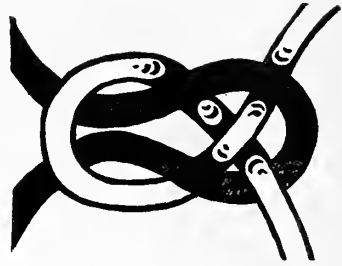
Netting may progress from one mesh, increasing first on one side then on the other, to form the diagonal half of a

PLATE XX.

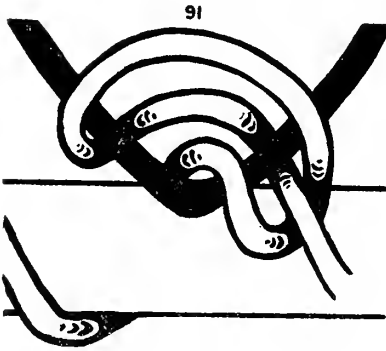
PLATE XX



90



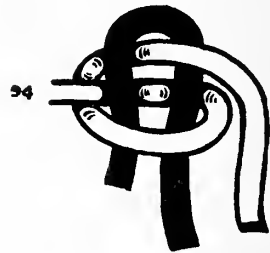
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91



93



94



95

90. Knotted on noose.

92. Sheet bend.

91. Netting or hammock knot.

93-94. Weaver's knot.

95. Carrick bend.

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square. From this one can diminish to a square or increase to an oblong. Let designs be made on point edge squared paper, lines running diagonally. Do not remove the pen from the paper, follow the lines and emphasize with a dot the point where the meshes net together. Every other mesh on the outside rows will have a double strand and two knots. Make designs with different sized meshes—diagonal and perpendicular.

Again, you can decide how many meshes wide you wish your net or hammock to be, and set up that number on the saddle. The mesh-stick enables you to always keep the mesh a uniform size, and for fancy netting several sizes are required. A stiff piece of card can be used, but the broader top, or wedge shaped wood, is an advantage in heavy work.

In netting, always work from the left toward the right; when the limit is reached on the right, remove the mesh-stick, turn the work over and net again from the left. Designs experimented with on the point edge squared paper will suggest ways of varying the patterns.

For a circle or round mat, set up a given number of stitches on a saddle of fine thread, tie this tight and let the netting proceed continuously. Make designs on the half-circle with different sized meshes.

The black line in the diagram shows the saddle (or next mesh of previous row of netting), the white strand comes from the last knot, over and under the mesh-stick, thru the mesh from behind. Hold this with your thumb on the stick; carry the end to the right, then over the mesh, under it, and out thru its own bight on the right. A similar knot may be worked toward the left from your thumb. Draw the thread tight with a jerk, and be sure that both meshes twist one over the other. Design fringes with and without points. For a hammock, No. 18 gray fishnet twine is good or the common hard twisted white cotton cord Nos. 20-24. An easy way to set up a hammock, is to start with one mesh. Wind the thread twice about the mesh-stick, tie the end with a hard knot. Slip off the stick, run a saddle thru the mesh, and fasten tight. Hold the mesh-stick below the mesh, with the knot half-way down

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on the left side. Carry the shuttle with the cord over and under the mesh-stick, knot at lower point of first mesh. Remove the mesh-stick, turn over, make a new mesh on the left in the same way, knot and turn. Continue until you have the required width for your hammock, 45 or less on each row. Unfasten the saddle and slip it thru the 45 meshes on one side, fasten the saddle and now proceed from left to right across the netting. When the hammock is large enough, connect groups of the end meshes with long loops to a metal ring, bind firm close to the ring. This is a capital problem for boys in the seventh or eighth grade. Make designs for different sized meshes.

FIGURE 92. The weaver's knot may be made in two ways and the standing bowline is found to be of the same construction. It is a flat knot, holds fast and may be worked with short ends. It is used by haymakers in binding their sheaves, by basketmakers in the ray-stitch, by weavers and lace-workers, as well as in heraldry. Sailors call it the sheet bend.

Fold the left (dark) strand toward the right, bring the right strand (light) from above, under the loop, over both ends on the left, under both strands diagonally on the right and out thru the lower half of the first loop.

FIGURES 93, 94. The other method of construction is to hold vertically, in left hand, the short end in the work. Pass the new strand from the left, under the first, in front of your thumb, looping toward the left, under the second end, and over the first. Now push the first end into the loop over your thumb. Hold all four ends as you draw tight.

FIGURE 95. The Carrick bend is another sailor's knot familiar in heraldry and Celtic interlaces. In fine soutache braids or lacers, it makes good pockets or shopping bags. Raffia is too soft to be successful. With several strands of lacers or solid braid it makes good belts.

Bring the left (dark) strand from above, make a vertical, underhand loop toward the right. Bring the right (light) strand from above diagonally under the dark loop; then weave

PLATE XXI.

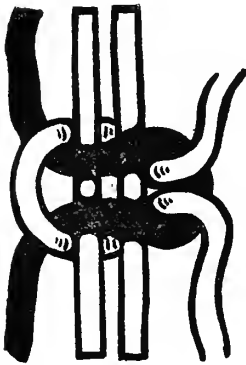
PLATE XXI



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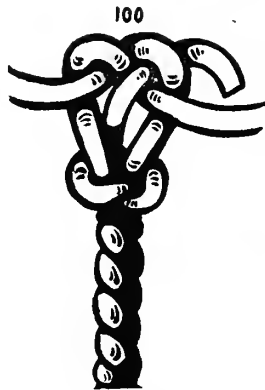
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97



99



100

96. Reef, flat knot.
97. Solomon's knot.

98. Square or crown knot.
99. Wall knot.

100. Wall and crown knot.

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the end over, under, over the dark ends, under its own diagonal standing part and out over the dark loop.

FIGURE 96. The flat, reef or surgeon's knot is the strongest for tying and is the basis of a bow knot. From the left and the right bring the two strands together, cross with a half-hitch; the dark over and under the light. Turn both ends back and repeat the half-hitch, crossing the dark under the light end, over it and down thru the loop. Notice where the loop is on top, both ends lie below; where the loop is below, both ends lie above. A variation of this gives the granny knot, which slips.

Children make a chain by tying this flat knot around a pencil, bring the ends successively about this foundation, and knot each time. If two cords of different colors cross at right angles tie each two ends in a half-hitch over the other at right angles to the last and we have a spiral chain.

FIGURE 97. The Solomon's knot is a favorite in Macramé or knotted bags, hats, etc.; the Japanese use it over jars and bowls with fine bamboo or cane. It is good to protect flower-pots or vases. Allow four strands for each group, tie the first and fourth about the second and third in flat or reef knot. Carry the third and fourth as they now stand to tie with the first and second in the next row.

FIGURE 98. The square knot may form a four-sided or crown-knot chain, and has been in great vogue with children for making leather fobs for watch-chains. It is derived from the wall and crown finish the sailor gives to rope, as in figure 100. A loop may be first tied for the fob, or the two strands may at once be laid at right-angles in the middle. If the horizontal (dark) strand lies underneath, fold the right end over, below to the left; the lower (light) end up on the left over this; the upper (dark) left end to the right; the upper (light) end down thru the first loop; draw all firm. Repeat until within four inches of the ends, complete with the wall and crown.

FIGURE 99. Carry each end for the wall knot under the next and toward the center, the last thru the first loop. With the strands in the center, repeat the square or crown knot

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(figure 98). To double this or make a firmer ball, let each end follow the strand nearest to it and come out under the walling.

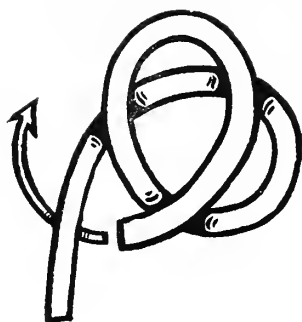
FIGURES 101, 102. The Turk's head is the Chinese button which they make largely of cloth. In reeds it is very useful and ornamental on a basket. Take half a piece of round reed (No. 3 or No. 2), near one end make an overhand vertical loop towards the right, over this a horizontal, overhand loop toward the left. Weave the end under, over, under, over, under, until it forms a trefoil. If you are to form a button or knob, begin at once to model it up into a round shape. Let the last end now follow the first, on the right and inside, thru all its windings for a four strand interlace, when the knob is solid. Use the first and last ends of reed to fasten into the weaving of the basket.

A ring may be thus braided if before repeating, the center is opened and the strands follow on the left or outside of the first end.

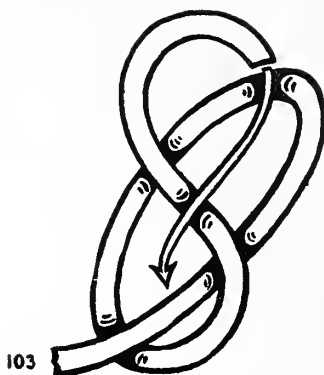
FIGURES 103, 104, 105. The Henage Knot. Like the last problem, this suggests the interlacing so common on the stone monuments of Celtic design. A great variety of charming lace patterns originated from these, wrought in fine thread, iron, stone or illuminations on vellum. Altho this interlace is a favorite for braid trimmings, it has been practically known in reed work as the beater. For this, use several strands of reed, and work with one from the start, or all together. Notice that a strand always passes under or over two strands, if the third element interweaves. Start with the center of the reed, cross the ends to form a figure 8; carry the left strand to the right and the right strand to the left. If the lower left strand is over the crossing, carry it under the upper loop, down under the lower loop, out over the right of the crossing. Carry the right under strand up, allowing it to interweave as it crosses the other loops, until it returns on the right of the crossing. Loop each of these ends back toward the center, as in Figure 105. The last ends should be long and a firm reed, looped below, form the handle of the beater. This must be covered with a binding of fine cane, fastened at the end of the handle like the bound border No. 1.

PLATE XXII.

PLATE XXII



101



103



102



104



105

101-102. Turk's head.

103-104-105. Henage knot, beater.

VIII.

PRACTICAL APPLICATIONS.

"Art necessarily presupposes knowledge, in any but an infant state, scientific knowledge; and, if every art does not bear the name of a science, it is only because several sciences are often necessary to form the groundwork for a single art. So complicated are things, for *one to be done*, we must know the nature and properties of many things."

JOHN STUART MILL.

A few suggestive lists are given from which teachers can make their own selection, and in their own way apply the foregoing principles of handwork. Many books and countless magazines might be mentioned. I will name the fewest possible.

ABORIGINAL AMERICAN BASKETRY.

By Otis Tufts Mason. Doubleday & Co., N. Y.

HOW TO MAKE BASKETS, MORE BASKETS, AND HOW TO MAKE THEM.

By Mary White. Doubleday & Co., N. Y.

HOW TO MAKE INDIAN AND OTHER BASKETS.

By George Wharton James. Passadena.

HOW TO DO BEAD-WORK.

By Mary White. Doubleday & Co., N. Y.

KNOTS, TIES AND SPLICES.

By Tom Burgess. Routledge & Co., N. Y.

VARIED OCCUPATIONS IN STRING WORK.

By Louisa Walker. MacMillan Co., N. Y.

ENCYCLOPEDIA OF NEEDLEWORK.

By Theresa Dillmont. Brentano, N. Y.

PRACTICAL APPLICATIONS

“Understand this clearly: you can teach a man to draw a straight line and to cut one; to strike a curved line, and to carve it; and to copy and carve any number of given lines or forms, with admirable speed and perfect precision; and you call his work perfect of its kind; but you ask him to think about any of these forms, to consider if he cannot find any better in his own head, he stops; his execution becomes hesitating; he thinks, and then ten to one he thinks wrong; ten to one he makes a mistake in the first touch he gives to his work as a thinking being. But you have made a man of him for all that. He was only a machine before, an animated tool.”

JOHN RUSKIN.

COURSE IN FREE-WEAVING, BASKETS.

- GRADE 1. Cut silhouettes of baskets, make card baskets round, square, for May baskets, with cord or raffia. Wind raffia.
- GRADE 2. Weave folded muslin strips from the center, card or oak tag baskets. Mats of reed-winding and raffia.
- GRADE 3. Weave with splints and flats, baskets and trays. Reeds No. 1, 2, 3, 4. Make square cornered boxes of card. Bind raffia mats.
- GRADE 4. Silhouettes of baskets, working drawings. Design line borders on circles, squares, oblongs. Round reeds 1, 2, 3, 4, fruit baskets, berry baskets, nutting baskets, with handles. Plain, ribbon weaves and pairing.
- GRADE 5. Twined baskets or boxes. Draw sides and design patterns on squared paper. Reed-winding with raffia, string-ball, cases, pencil trays, pocket for wall, lunch boxes.
- GRADE 6. Reeds 1, 2, 3, 4, raffia, reed-winding, triple twist and fancy weaves. Work basket with cover. Baskets for special uses. Draw and design, round and square cornered baskets.
- GRADE 7. Girls, palm-plaiting, flat cases, boxes, envelopes. Draw and design on the diagonal. Boys, large scrap-baskets, wooden, woven bottoms, reeds. Nos. 4, 5, 6.

PRACTICAL APPLICATIONS

GRADE 8. Girls, trays of cane over wooden bottoms, cane and reed-winding woven baskets. Draw and design. With the boys, make covers for stools, rush, splint, cane, reed-winding, raffia.

A list of round baskets to be woven, twined, wrapped or sewed. Make designs.

Button basket.	Umbrella holder.
Key basket.	Golf-stick basket.
Nut basket.	Vegetable basket.
May basket.	Tea tray.
Flower basket.	Cover for glass.
Fern basket.	Cover for bottle.
Berry basket.	Cover for match-holder.
Trinket basket.	Cover for finger bowl.
Candy basket.	Clothes hamper.
Candy basket, covered.	Cover for casserole.
Lunch basket.	Cover for plant pot.
Card basket.	Stand for tea-pot.
Bottom for work-bag.	Twine basket.
Work basket.	Cover for ball of knitting yarn.
Work basket, covered.	Knitting basket.
Mending basket.	Egg basket.
Stocking basket.	Lamp tray.
Spool basket.	Baskets with handles.
Pin tray.	Baskets with rings.
Baby basket.	Hanging basket.

A list of square cornered baskets made of splint, sweet grass, reed-winding, reeds, palm, flats, raffia, Manila-hemp-fiber, pine-needles, etc., etc. Constructed in any of foregoing methods.

Afternoon tea tray.	Dress suit case.
Letter tray.	Shopping bag.
Desk basket.	Baby basket.
Postal card case.	Scrap basket.

PRACTICAL APPLICATIONS

Photograph tray.	Wood basket.
Pencil tray.	Dog basket.
Brush and comb tray.	Clothes hamper.
Glove box.	Market basket.
Handkerchief box.	Basket with handle.
Candy box.	Bread basket.
Palm traveling bag.	Fruit tray.

COURSE IN BASKETRY.

- GRADE 1. Winding. Picture frames. Rings.
- GRADE 2. Braiding. Mats. Belts. Dolls' hats.
- GRADE 3. Raffia weaving, card looms. Knotted bags, raffia, cords.
- GRADE 4. Reed work commenced. Basket with weaver spoke. Simple round reed baskets, mats.
- GRADE 5. Reed baskets, with handles. Different weaves. Splint baskets.
- GRADE 6. Sewed baskets. Lazy-squaw, figure-of-eight, knot stitch.
- GRADE 7. Square cornered baskets. Twined baskets. Scrap baskets.
- GRADE 8. Chair-caning. Palm-plaited baskets.

COURSE IN COILED OR SEWED BASKETS.

- GRADE 1. Round card baskets, stitched. Wind raffia, cut silhouettes.
- GRADE 2. Lacers for looped stitch, mats, bags, pockets, chains. Paper and muslin patterns for bags.
- GRADE 3. Knot raffia, make handles for bags over raffia and reed. Raffia cross-stitch over splints for trays, boxes. Design striped borders.
- GRADE 4. Sew raffia over raffia or rope. Card model for round basket. Design for border, for center. Baskets and mats and bottoms for bags.
- GRADE 5. Crochet and knot school-bags. Twined baskets. Bead chains. Make working drawings, patterns and designs. Wrapped stitches.

PRACTICAL APPLICATIONS

- GRADE 6. Appliqué embroidery, satin stitch edge. Design in color on linen. White doylies, towels, laid work. Baskets close-sewed and ray stitch. Make working drawings, patterns and designs.
- GRADE 7. Raffia, round reeds, long and short stitch, figure-of-eight stitch, bottoms for knotted bags. Shallow trays. Make working drawings, patterns and designs.
- GRADE 8. Raffia and round reeds, oblong trays for pencils, jewelry, desk fittings, lamp mat. Sweet grass, corn-husks, pine-needles, or grass gathered and prepared, ray stitch. Knot or lace stitch with or without beads. Make working drawings, patterns, designs.

COURSE IN KNOTS, NETTINGS, ETC.

- GRADE 1. Chains, mats, of cord, lacers, knots and beads. Fold paper, crayon line designs.
- GRADE 2. Knot bags, mats, balls, belts, doll's hammock. Draw new patterns with crayons. Lacers, raffia, cord.
- GRADE 3. Braid chains, fobs, mats. Loop bags with lacers. Make paper patterns for bags. Lacers, raffia, cord.
- GRADE 4. Crochet balls, caps, wash-cloths, round and square bean bags, laundry-bags, pockets. Make working drawings, patterns, designs for line borders.
- GRADE 5. Fancy knotted bags, school-bags, work-bags, pockets. Make working drawings, patterns and designs on squared paper.
- GRADE 6. Knitting, scarfs, wash-cloths, baby's sack, purse, shawl. Make working drawings patterns and designs on squared paper.
- GRADE 7. Drawn-work, cut-work, knotted lace stitches, doylies, collars, cuffs, tray-cloths. Make working drawings, patterns and designs on the square.
- GRADE 8. Net shopping bags, fringes, hammocks, tennis-net. Vary the designs. Tape lace mats, collars. Make working drawings, patterns and designs.

PRACTICAL APPLICATIONS

COURSE IN FRAME AND LOOM WEAVING.

- GRADE 1. Seegmiller bogus-paper mats, children tint one-half, cut and weave. Fold, tint, cut and weave paper mats with strips of card.
- GRADE 2. Muslin folded, free weaving from the center. On straw-board frame, twine warp, colored rovings, jute in stripes. Paint stripes of color.
- GRADE 3. Fairbault or card frame. Twine warp, raffia warp, weft of jute, cotton rovings, raffia. Cushion covers, geometric tapestry designs. Bags. Design on squared paper.
- GRADE 4. Weave on card frame, white tape $\frac{1}{4}$ inch, make belts, doylies, pockets, covers, cases. Warp and weft alike. Make working drawing, patterns, designs for cross-stitch with red and blue embroidery cotton.
- GRADE 5. Raffia on frame, warp and weft alike, purse, card case, pad-covers, blotters, postal card cases. Bargarren or heavy linen on Woodbury loom. Raffia over splint, free weaving. Make working drawings, patterns and designs on squared paper.
- GRADE 6. Card frame, stretch threads, open and solid pattern effects. Knotting and needle weaving. Make working drawings, patterns and designs on squared paper.
- GRADE 7. Portfolio, book-cover, photograph case, travelling case. Fine linen, silk threads stretched for warp and same woven for weft, or darned figures like weaving, or threads stretched for Spanish laid work.
- GRADE 8. Linen Thread Company's loom, or on cards, tapestry stitch. Cotton warp; silk, worsted weft. Bags, belts, cases, covers. Make working drawings, patterns and symbolic designs.

PRACTICAL APPLICATIONS

COURSE IN BEAD WORK.

- GRADE 1. String beads for counting, for repeats, even and uneven. Cord with beads held at intervals by knots. Chain of two colors, return the thread. Make patterns on folded paper with colored paper dots and squares.
- GRADE 2. Daisy chains, loop chains, braided chain, three strands of beads. Ribbon button-bag, edge beaded. Cut and paste colored paper, free cutting designs.
- GRADE 3. Rosettes on wire for buckles, lapels for ribbon pockets, bottom of work-bag. Free sewed chains, five beads. Design with crayon on folded square paper.
- GRADE 4. Crochet silk belt, purses, pockets with scattered bead units. Design with units.
- GRADE 5. Card loom chains; leather pen-wipers, needle-books, knife-sheath, belt-purse, with beaded edges.
- GRADE 6. Cut paper patterns for children's moccasins, pockets, purses; make of cloth or chamois with borders in beads. Design borders.
- GRADE 7. Design and make linen appliqué sofa pillow or cover for note-book. Sewed basket, knot stitch with beads. Knit bead designs on bag, pocket.
- GRADE 8. Leather cases or covers for special uses, cut-work held by beads. Design and sew beads on the leather.

SUPPLIES.

A FEW ADDRESSES FOR SUPPLIES :

*For rattan by the wholesale in 5 pound bundles; reed-winding,
flats, cane bundles, 1,000 yards.*

AMERICAN REED AND RATTAN MANUFACTURING COMPANY,
Norman and Kingsland Avenues,
Brooklyn.

UNITED STATES RATTAN COMPANY,
Madison Street, Hoboken, New Jersey.

*Metropolitan lacers 2½ yards, by the gross, white, gray, black..
Spool narrow tape, 1,000 yards.*

CALHOUN & ROBBINS,
408 Broadway, New York.

Beads.

S. A. FROST'S SON,
33 Howard Street, New York.

*Raffia, palm, splints, cotton rovings, manual training materials,
looms.*

J. L. HAMMETT COMPANY,
250 Devonshire Street, Boston, Mass.

MILTON BRADLEY,
11 East 16th Street, New York.

Swedish loom.

MISS GLANTZBERG,
New Britain, Connecticut.

Cable, Macramé, druggists' cord, per pound, in hanks or balls.

JOHNSTON & COMPANY,
3 Lispenard Street, New York.

SUPPLIES.

Colored worsteds.

A. & M. KARAGHEUSIAN,
19th Street and Broadway, New York.

Linen floss and looms.

LINEN THREAD COMPANY,
96 Franklin Street, New York.

Colored raffia, jute, twine, etc., per pound.

CHAS. E. MATHER,
Braggville, Massachusetts.

Yarns, cotton, linen, hemp; sisal twines, wicking, tubing; rope, per pound.

J. P. NAWRATH & COMPANY,
111 Wooster Street, New York.

Reed, raffia, sweet grass, pine-needles, ash-splints.

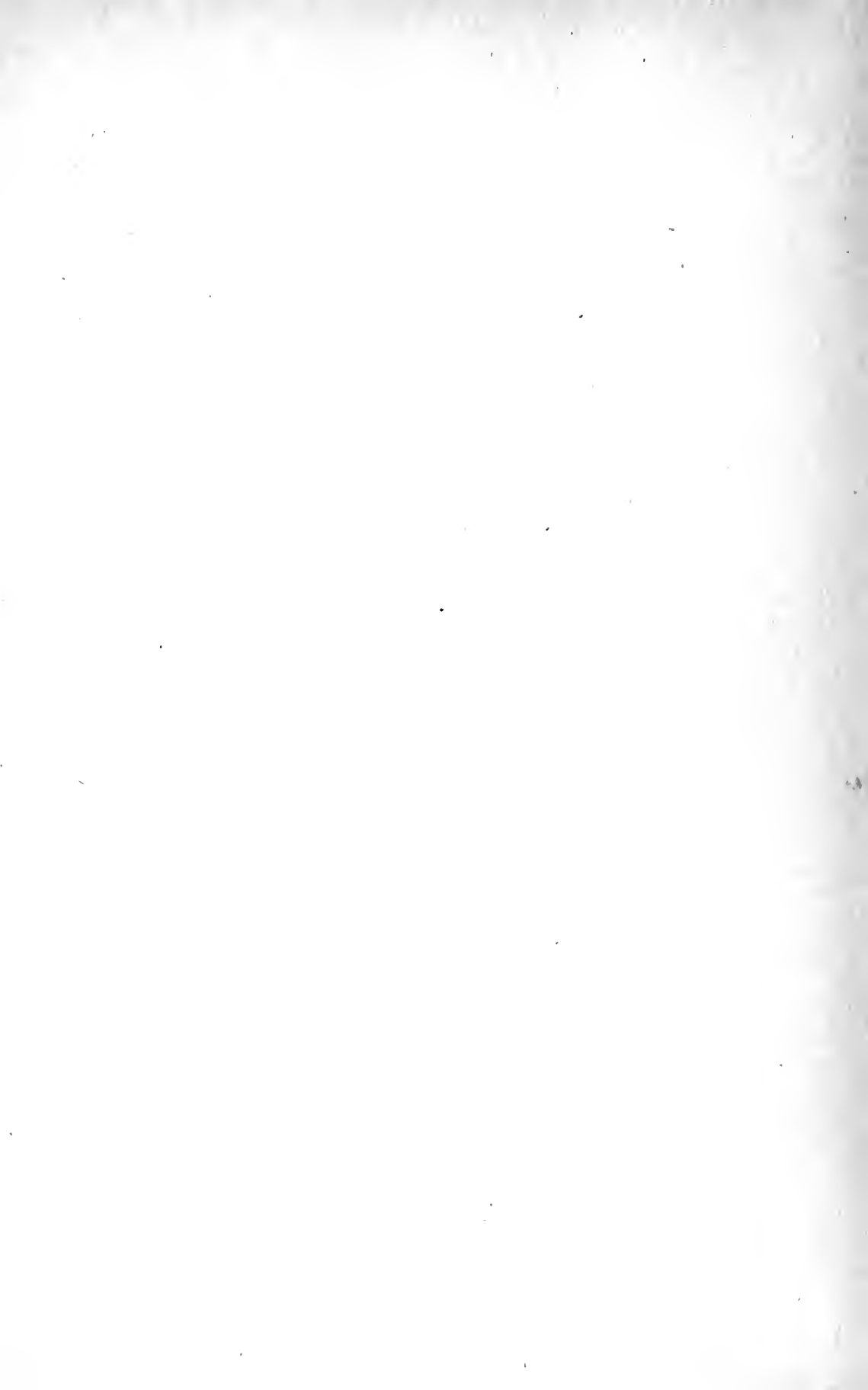
VAUGHAN'S SEED STORE,
14 Barclay Street, New York.

Leather.

M. B. WILLCOX,
180 William Street, New York.

Yarns, cotton and worsted.

F. A. STRAUS,
93 Greene Street, New York.



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